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MISTAKES.

Any man may commit a mistake, but none but a fool will continue in it.—Cicero.

Telephone Service and the Movies.

In the current issue of The Telephone Bulletin is a story "Telephone Service and the Movies." It tells of the impression received by the public from moving pictures of the methods which supposedly prevail in the operating rooms of telephone exchanges. Telephone men witnessing moving pictures showing scenes in telephone exchanges know the telephone operators and their actions as depicted on the screen are but a crude burlesque of their actual performance. The description in The Telephone Bulletin is typical of the manner in which the telephone operator is caricatured. It states, "When they shifted operators, the smiling supervisor led them in, the girl on the board took off her head set and either threw it onto the keyboard or passed it on to the incoming operator. Ethel (the heroine) talked with subscribers from the switchboard, and when she got to the exciting part, the operators, supervisors, and manager crowded about her, listening through the back of her head to what was going on."

The public after witnessing a number of films of this sort really believe the work in the telephone exchange is carried on in much the same way as pictured. Then when something goes wrong and they are angered, the telephone manager has a hard time to explain matters satisfactorily. Apropos of this, the article says, "What is to be the remedy? Are the telephone companies going to do nothing to offset this movie foolishness? We have seen interesting moving pictures of many industries, but never any of the great telephone business. It distinctly appears to us little fellows that some of the big fellows ought to get busy, and by means of films of the various occupations in our business, interest and instruct the public in telephony as it is."

Telephone companies have done much by means of receptions and other publicity, to educate the public in regard to the methods used in carrying on their business, but it seems that the "movies" are an important factor that apparently has been overlooked. According to statistics which have just been made public, some 3,600,000,000 spectators witnessed moving picture presentations during the last year. Also the statement is made that 10,000,000 feet of picture films are produced weekly.

It is evident that the moving picture may be the indirect source of great trouble to telephone companies in their relations with the public. That it can also be made a tremendous influence for good instead of evil will be conceded after reading the statistics. If telephone men, acquainted with those in charge of the production of moving pictures, pointed out to the latter the bad effect of the misrepresentations such as are now common and also suggested the proper routine to follow, the relations between telephone companies and the great telephone using public would be greatly improved.

The Maintenance of Substation Equipment.

The proper maintenance of substation equipment is an important actor in supplying good service. Various companies have different methods of caring for the subscriber's equipment in order to keep it in proper condition. Some of these methods are satisfactory but many of them are not. Many companies rely upon a casual inspection of instruments once or twice a year to keep the equipment in shape, while others have no definite routine.

The method of making these inspections is decidedly important. The inspector should have his duties definitely laid out. His tools and supplies should conform to certain standards while his instructions should be so specified that if the work is not properly done, he may be held responsible for it. These points and many others which tend to make the inspection of substation equipment thorough and effective, are discussed in the article by Mr. Kinsley, which appears on other pages of this issue.

The Most Useless Thing in the World

By HERBERT KAUFMAN

Hurry more and you'll worry less. You can't gain by moping and you may attain by hoping. Regret is a poor cement—it can't mend anything. Don't poison tomorrow's hope with yesterday's despair. Nothing can be half as bad as you can picture it. The amount of vitality it takes to chew the cud of misfortune will extract enough mental nutrition to create another fortune.

Work it off! Worry is a disease of idlers. Despair is a fungus—a parasite that absorbs the vitality of the will. No man can keep the same ear filled with energetic ambition and enervating doubts.

You discount on the wrong end. Shift! Try the other side and maybe you'll get a viewpoint which shows that you're half as badly off.

If you don't believe in yourself, you're lost before you've fought. Master your fears! Just give yourself the show that you'd ask from anyone else, and you've won the greatest part of your battle because you've gained the allegiance of at least one firm believer to take the place of a traitor.

Perk up! Get the yellow paint out of your veins and instead fill them with the blood of determination. Control yourself and you needn't bother about the rest of us.

Granted that you have your troubles—forget them. They're the most thoroughly useless things on the face of the earth. Grow busy and they'll grow small.

Worry is like a mold. It can't get hold of anything that's moving any more than a creeper can cling on a spinning fly wheel.

If you're threatened with reverses, remember that rain doesn't fall from every storm cloud. Each hour that intervenes gives you an opportunity to find an umbrella —to plan some way of surviving.

No man can do his best when he is tied hand and foot with his doubts, and shackled with fright.

The last barrier, thrown up at the last moment, has saved more than one army from annihilation. So long as you can stand, remember that you're not downed. As long as you can hope, there's a chance to fulfill the hope. You can always be defeated —that will take care of itself without any aid from you.

Every other failure is through fear. Grit is the biggest asset you can own. Old Man Hallowell didn't think more of a dollar than you think of your right eye. But he loved pluck more than money, because pluck is the mold in which money is minted. He built his fortune by backing up men who never backed down.

Charlie Walters might have been even as big as he thought himself if he had kept his nerve keyed up to the same pitch as his fear, but the "Old Man" caught him looking over an insurance prospectus one day. It was just when Charlie's concern was getting it hard from a half dozen quarters and Hallowell's backing was the very backbone of his resources.

"What's the matter, Charlie?" Hallowell asked.

"Oh, nothing, I was just figuring on some more life insurance. You see, there's just one chance that we may go to the wall, and I thought I'd look out for the future."

"Charlie," said Hallowell, "instead of figuring over those policies, you sit right down and figure who'd be likely to buy my interest. I'm through. I'll follow a fighter to Hell, but I won't follow a flunker to the corner. Since you've reached the conclusion that there's one chance of our failing, I've made up my mind that we haven't a chance. You ain't got the stuff in you to win. You can't down your own nerves. If you'd spent more time calculating how to beat the game, instead of abusing your days and nights snooping around for pitfalls, you and me would still be "We." When a man is looking for trouble, his eyes become telescopes—he can see it on Mars. A leader who don't believe in his own cause ain't got any. You've kept worrying and worrying over nothing. Now begin to bother over something. It's happened. Any man who worries long enough won't be disappointed."

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The Routine Inspection of Telephone Substation Equipment

The Duties of the Instrument Inspector—His Tools, Instructions, and Supplies—The Inspection Cards and Information They Should Contain—Methods to Be Followed in Making Inspections—Reports of Inspectors and Gradings Showing Thoroughness of Work

By W. W. Kinsley, Jr.

A telephone company sells service, and the amount of those sales as well as the final satisfaction of the patron, depends as much on the condition of the telephone apparatus as on the efficiency of the operating force. Particular care should therefore be taken to keep the equipment in good condition. Periodical or routine inspections of the equipment provides a good means for caring for the apparatus and lines.

There has been some discussion as to whether routine inspections should be made at the time of clearing a case of trouble. Some claim that if the district involved is a scattered one, such as is found in an outlying district of a large city, or in a comparatively small city or town, it may be economical to make a complete inspection at the time of clearing the trouble. They also claim in some cases it is found that a subscriber is suspicious of an unknown repairman who appears to work on a telephone on which trouble has not been reported, and that it is therefore better to make the inspection when the repairman is on the ground.

On the other hand, others argue that when an attempt is made to clear trouble as rapidly as possible, it is advisable to omit all routine work until after the trouble is cleared. Sometimes this resolves itself into the proposition of having special men on routine work, who can be pressed into service, in time of storm, for repair work.

While the question as to when the routine work can best be done has to be left to the local manager, yet it is generally conceded that the equipment should be thoroughly overhauled from time to time in order to keep it in efficient condition and to prevent loss of revenue due to lines being in trouble.

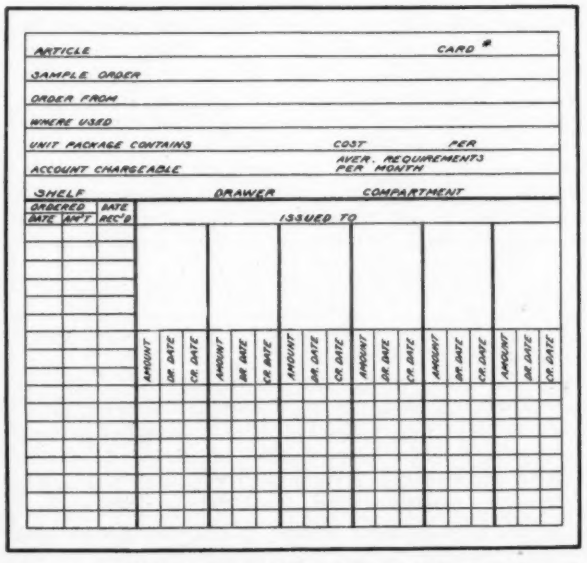


Fig. 1. Order Memorandum, Stock and Inspector's Loan Record.

In this article will be considered only the work of the instrument inspector, but it will be borne in mind that he frequently does wiring, changes instruments or other equipment, clears trouble that takes him away from his routine work, and that the routine inspection work is work of a nature which generally does not need to be done at once.

The inspector needs to have readily available all of the necessary material and parts which he will use in doing his work. If he finds that the storeroom does not carry as complete a stock as he needs, there will be a tendency for him to carry a private stock at a point where he will alone have access to it.

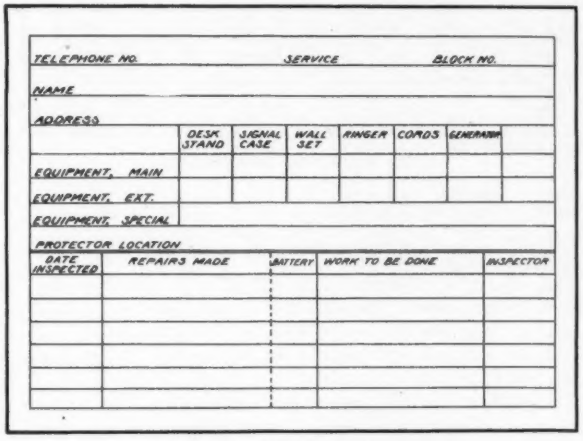


Fig. 2. Inspection Card.

Wire, staples, screws, cords, tape, solder, batteries and other short-lived parts can be issued with comparative freedom to the inspector. The valuable or long-lived parts, such as receivers, transmitters, ringers, induction coils, condensers, desk stands, etc., should be charged out to him at the time of issuance and credited on return.

The man handling all of this stock should keep well posted as to the requirements. For this purpose the form shown in Fig. 1 has been devised as a combination stock record, order memorandum and inspector's loan record.

These forms should be printed on cards about 5½ in. by 8 in. so that sufficient room will be provided for a number of entries, and so that a standard size filing cabinet may be used. A card should be made out for each article ordered, whether it is large or small. Its common name should be shown under heading "article," as the supplier's code name is frequently not known to the men. The column, "average requirements per month," is made up from previous records and is constantly subject to change. It provides an excellent guide for the amount that is to be ordered. Provision is made on the form for a record as to the location of the stock in the stock room.

When any article begins to get low, a Gem paper clip or other device can be attached to the right hand side of the card as a marker. Then when an order is being made out, it is an easy matter to select all of the cards on which an order needs to be entered. The clip can then be moved to the left-hand side of the card to indicate that an order has been placed. When the material is received, the cards may be readily selected and the "received" date entered.

If desired, the form may be modified to provide for a continuous inventory by inserting a column in which is shown the amount of stock on hand after each transaction. The debits and credits to the various inspectors provide a means for determining whether any of them replace or use any material or supplies unduly fast.

Costs of equipment and material should be kept con-

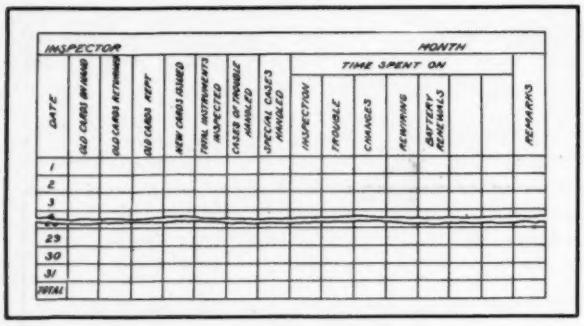


Fig. 3. Inspection Card Record.

stantly before the inspectors, so as to assist in preventing waste and to prevent replacement where replacement would not be economical.

The inspector should be provided with the necessary specifications, circuit drawings and such general instructions as he needs to assist him in doing his work. He should provide himself with those tools which the company does not furnish.

The tools carried should include the following: 1 pair long nose pliers; 1 pair side-cutting pliers; 1 large screw driver; 1 small screw driver; 1 small hammer; 1 pair of climbers; 1 dust brush; 1 small file; 1 test set; and 1 soldering iron; such keys as necessary; and wrenches to fit all nuts; also 1 belt and safety strap; 1 hand line; 1 pair rubber gloves; 1 connecting iron, or connecting pliers; 2 Buffalo grips; 1 jack strap or 1 pair slack blocks and rope; and 1 set of identification papers.

An inspection should be made from time to time to see that the tools are in proper shape and are adapted to the requirements. The material should also be inspected to see that a sufficient supply is carried to do the work.

Routine inspection cards shown in Fig. 2 should be made out for each telephone; for each branch exchange switchboard; and for any other units that it may seem well to periodically inspect. This includes items such as aerial wire or cable routes, conduit routes or cable terminals.

The form should be printed on a tough card. It should be of a size convenient to carry in the pocket and still provide enough space to record the items listed. A standard size, which is about right, is 4 in. by 6 in. The inspection record space on the front should be extended to the back. A case with stiff covers should be provided to carry the cards in, as it will save them from injury, lessen the chance of loss, and assist in keeping them clean.

Among the items shown on the card is the "block number." It is desirable to lay the district off in blocks, as it makes it possible to route the cards and makes their refiling easy after an inspection has been made. The cards held by the inspectors should be looked over from time to time to make sure that some are not being held unduly long without inspection, and to be certain that all reported are being held and not lost. The equipment should be filled in when the station is first visited, and checked up on each subsequent visit.

In magneto districts the type of generator should be included in the listed equipment and the condition of the batteries should be especially noted. In the column of "repairs made," all of the work done should be listed, even including the minor items. Under "work to be done" should be listed anything that is not cared for, and that needs to be done. The card can then be held out of the file until the work is completed. Such work might include a change of desk stand, a battery renewal, wiring to be rerun, etc.

These cards should be issued to the inspectors as needed. A record should be kept as shown in Fig. 3, in which are debited and credited the inspection cards.

On visiting a station, the inspector should, without being asked, tell the subscriber the nature of his business and should, upon request, present his credentials. Chairs, desks or tables should not be pre-empted and care should be taken to not track dirt into the house. Any muss that might be made should be cleaned up, and in general the premises should be left in as good condition as they were at the start. The subscriber frequently wants to look on and talk. The less the inspector talks, the less he may have to explain to his superior later.

The inspector should thoroughly inspect a piece of the apparatus, and put it in order before proceeding to the next one. The operator should be called and asked to ring the bell in order to see what condition it is in before any work has been done. This gives the inspector a chance to make a transmission test and will prevent later disputes as to the condition of the equipment before work was done.

While the operator is ringing, each gong should be tested, by damping the other one, to see if it is ringing clearly. In those districts where the bells are adjusted to gauge, the gongs should be loosened and moved back from the clapper. Then the spacing at each end of the armature should be carefully adjusted. Care should be taken to see that the armature is at right angles to the magnets when it is in a middle position.

The permanent magnet may be tested with a screw driver and the ringer should be inspected for loose mounting or other screws. The gongs should then be moved back until, when the clapper is over as far as it will go without springing it, there is a space of about the thickness of a piece of paper between the clapper and the gong. The bell should be rung again, and if there is a tension spring, it should be adjusted for a maximum ring.

All of the connections in the signal case or wall set should next be inspected for loose joints, screws or locknuts; for wires not under washers or two wires under one washer; for foreign material; for hook switch contacts which do not make or break, or for other conditions that might later produce trouble.

If the instrument is equipped with a coin collector, it should be tested for operation, loose connections, loose locknuts, wires not under washers, or two wires under one washer.

The transmitter should next be inspected to see if it is tight on its mounting; if no screws are missing; if no screws are loose; if it is packed; if the mouthpiece is clean and whole; and, if a number plate is used, if it is correct.

The receiver should be examined for loose or weak magnets; loose connections; dirt in the magnets; dented, bent or reversed diaphragm; too small air gap between the magnet and diaphragm; broken or cracked shell, or defective cord.

Where there is a desk stand, it should be inspected for loose connections, screws or locknuts, missing screws or locknuts, defective cords and switchhook trouble.

The inside wiring should then be gone over for bad maintenance conditions. The protector should be examined for dirty carbons; loose connections; wires not under washers or two wires under one washer; and loose or missing locknuts. The ground wire should be inspected

to see that it goes to a pipe which has no shut-off valve between the point of contact and the ground, or to a ground rod which is driven in a place that should be permanently damp. The ground clamp should be tight and the connection with the ground wire should be good.

If there is any special apparatus, such as extension bells, push buttons or buzzers, etc., it should be gone over to make sure that it is in good operating condition, and has no loose connections, screws, nuts or other defects.

Some consider it good practice to have the inspector clean the nickel plating, as he then is forced to thoroughly look over some of the parts. This keeps the plant looking well and helps to make a satisfied subscriber.

At the time of making the inspection, record should be made on the card of all that has been done, and of all that needs to be done, which for any reason, should be done at a later time.

At the time of coming to the house, or of inspecting the protector, the drop wire should be roughly inspected to see that it is up properly; that it does not pass through trees or touch wires or fixtures where it may be damaged; that it has the proper drip loops; and that it passes around corners properly, etc.

Branch exchange switchboard inspection should cover particularly the condition and operation of the keys and relays or signals, the condition of the cords or plugs and of the operator's set. The inside of the board should be kept free of dirt, and the forms properly dressed. The night alarm circuit for each line should be tried out and the battery and ringing machine, if any, tested and inspected.

Every half-hour, or at the completion of an inspection, the tester should be called to see if there is any urgent work to be done.

The frequency with which the telephones are inspected will vary with the class of service that is being furnished. Public telephones and switchboards should be inspected monthly, single party business lines every two or three months, and other stations every six months. It is frequently found desirable to have a janitor visit and clean the company booths and public pay stations at monthly intervals or oftener.

If a trouble record is kept on each station, a record should be made on the trouble card of the date of each routine inspection, before the inspection card is filed.

Inspections per day.	Minutes per case of trouble.	Trouble per hundred stations.	Red mark for each.
30	2	1	16
28	4	2	15
27	6	3	14
26	8	3.5	13
25	10	4	12
24	12	4.5	11
23	15	5	10
22	20	5.25	9
21	25	5.5	8
20	30	5.75	7
19	35	6	6
18	40	6.25	5
17	45	6.5	4
16	50	6.75	3
15	55	7	2
14	60	7.25	1

Values for Making Up Inspectors' Gradings.

From the inspection cards and from the trouble records and special work orders should be taken the data required to complete the entries in the record shown in Fig. 3. This will include the number of cases of trouble cleared by the inspector and the time spent. The number of cases of special work, such as changing instruments, rewiring, changing batteries, etc., and the time spent should be entered. The balance of the day will then be the time spent on routine inspections. Time on a case is the time from the completion of the previous case to the completion of the case in hand.

These reports should be combined and a monthly statement made for the benefit of both the officials and the workmen. The statement should show the inspections per day, the time per case of trouble, and the trouble per hundred instruments. On such a basis the men may be graded and the gradings posted. These gradings or "red marks" will be determined from a set of arbitrary values given to each class of work. The amounts given in the table have been found to furnish a fair basis.

If the districts assigned to the inspectors have been properly apportioned, they will represent equivalent work units and the "Red Marks" earned by each man will be proportional to the work done. Some changes may be found necessary in this table to adapt it to the local conditions.

A weekly report should be made on a form similar to that shown in the illustration. Some sample figures are given.

These weekly reports should then be callected monthly and the items from which the "Red Mark" is derived, together with the mark, should be entered on a comparison sheet where the records from month to month are shown. Such a sheet is also shown in connection with the weekly report form.

From these reports a positive idea of the class of work that any man is doing can be readily gained as the thoroughness with which the inspection or trouble clearing is done, will control the number of cases per hundred instruments. The diligence used in making the routine inspections will determine their number and the ability to test for and clear trouble quickly will determine the speed per case. The inspector will call the tester every half-hour to get trouble which may have come in in his district If he fails to do so, his time per case of trouble will automatically increase, as the time is counted from the reported time to the O. K.'d time.

From time to time the work of the inspectors should be inspected to see that they are doing it properly. Gradings should be given, based on their work.

For a reported case of trouble not cleared deduct .....75 per cent
For a case of trouble that is left, which was not reported and is causing trouble, deduct .....50 per cent
For a case of trouble that is left, which was not reported and is actually not interfering with the service, deduct.....25 per cent.
For a minor defect that might develop into a case of trouble, deduct.....10 per cent.
For a minor defect that will probably not develop into a case of trouble, but which should have been fixed, deduct..... 5 per cent

The average of the gradings on the cases inspected will give the grading of the inspector for the period. Generally it is a good plan to have the inspector go with the chief inspector so that he may see his faults and may have no objections to the gradings allowed.

With the "Red Marks" and the inspection gradings, it is easy to determine which of the men are doing work that warrants an increase in salary. This scheme can readily be extended to include line work as well as instrument work.

Figures covering a year's work in a city having about 25,000 telephones gave the following amounts:

Inspections per day.....22.8 Red Mark 9.8
Minutes per case of trouble.....24.0 Red Mark 8.2

Trouble per hundred stations..... 4.5 Red Mark 11.0
Total ..... Red Mark 29.0

Should it be considered wise by the manager, the inspector might be called on to inspect various items of the outside plant as well as the instrument and inside wiring. The inspector should be reasonably familiar with the route

NAME	DAYS WORKED	ROUTINE INSP. No	ROUTINE INSP. TIME PER CASE	TROUBLE No	TROUBLE TIME PER CASE	OTHER TIME	AVERAGE COST PER CASE	RATE PER DAY
Bean	6.0	54	35.0	2	35.0	820	.230	$3.00
Berger	6.0	55	46.7	4	50.1	105	.196	2.00

WEEKLY REPORT

NAME	March INSP. PER DAY	March MINUTES PER CASE TROUBLE	March TROUBLE PER 100 STATIONS	March RED MARK	April INSP. PER DAY	April MINUTES PER CASE TROUBLE	April TROUBLE PER 100 STATIONS	April RED MARK
Bean	14.0	35.0	4.0	19.0	18.0	29.0	4.5	23.2
Berger	10.7	50.1	5.0	13.0	16.0	35.0	5.2	16.5

MONTHLY REPORT

Sample Form for Weekly and Monthly Reports.

of the conduit in his district so as to be able to warn other public service companies when they are found digging in the neighborhood of a conduit route. He should watch for broken manhole covers and might be called on to make occasional inspections for smooth or otherwise defective covers.

The terminal boxes should be inspected to see that they are sound and whole; that the locknuts are tight and the connections are well soldered; that lugs are not missing or broken; that the boxes are properly numbered; and that the pole fittings are safe, etc.

The route should be inspected to see where glass insulators are missing; where corner or end poles or arms need guying; and where slack needs to be pulled. As far as possible, defective poles and fittings and other dangerous situations that have not been reported in the course of the daily work, should be located and reported. Recommendations for cable changes should also be made, covering additional terminal boxes which should be installed to replace wires that are parallel to cable; cable that should be extended; and repairs that are needed.

Any part of the plant that needs repairing should be cared for by the inspector. If he cannot do the work, a written report should be made, which will permit the issuance of proper orders without further investigation.

Nebraska Commission Grants Raise in Rates at Lincoln

After Six Months of Investigation and Several Hearings, State Commission Decides Increase Requested by Lincoln Telephone & Telegraph Co. Is Justified—Action Based on Valuation of Property Under Commission's Direction—Statement by the Company

The Nebraska State Railway Commission has completed and is now preparing for publication a voluminous 60-page report presenting its findings in its investigation of the physical valuation, service and rates of the Lincoln Telephone & Telegraph Co., in Lincoln, Neb., since the consolidation of the Automatic and Bell exchanges in that city.

The Lincoln company made request to the commission six months ago for permission to raise the business telephone rate from $4 to $5.50 a month and the residence rates 50 cents a month flat. The commission allows the 1,600 business telephones to be raised to $6 a month instead of $5.50, but permits the residence rate to be increased only 25 cents a month. There are 2,600 individual line residence telephones in the city and 4,100 party line telephones, a total of 6,700. Roughly speaking, the company asked for an increase of $6,250 per month in Lincoln and is allowed an increase of about $5,000 a month.

The rates as granted by the Commission, effective on July 1, 1913, are as follows:

	Old rate	New rate
Business, individual lines	$4.00	$6.00
Business, party lines	3.00	4.50
Residence, individual lines	2.00	2.25
Residence, party lines	1.50	1.75

Residence extension telephones are cut from 75 cents a month to 50 cents. Under these rates free connections are given to all farm lines and to subscribers on the Havelock, University Place, Bethany, College View, Malcolm, Davey, Waverly and Raymond exchanges.

Any subscriber on these outlying and suburban exchanges has the choice of paying a local rate for a local service with a 5-cent toll charge for each call or paying the Lincoln rate and getting Lincoln service. All incoming calls on these exchanges are free. Farm lines are all raised 50 cents a month.

The foregoing rates are based upon the commission's valuation of the property of the Lincoln Telephone & Telegraph Co., a valuation which the commission believes to have been a very thorough and exhaustive one. The commission placed a reproduction value upon the company's property of $1,785,907 and a present depreciated value of $1,331,418. In other words, the commission finds that $1,786,000 has gone into the plant at one time and another, but that the depreciation has not been provided for. For years the company has been paying out in dividends money that ought to have been keeping up the plant. The present worth of the property is placed at $1,331,000. The new rates will not pay 7 per cent. on this amount, it is claimed, hence the commission rules that they are justified by the circumstances and should at least be given a trial.

In explanation of its valuation figures the commission says:

"Under the law the engineering department of this commission made a full, painstaking and complete valuation of all the physical properties of the telephone companies and their various exchanges, comprising the plant as consolidated and under consideration in this hearing as of July 1, 1912, and since have, by making further investigation, inventoried all the additions and betterments down to date. The values for each of the component parts of the Lincoln zone prior to the consolidation were made up separately and then assembled, eliminating whatever of plant or apparatus became useless by reason of the consolidation, except only such part of the conduits, cables and transmission lines and apparatus which would form a reasonable building in advance of immediate needs. From a careful study of the various parts of the plant and an actual estimation by examination and determination of age, the department also ascertained the present depreciated value of the whole.

In the result of these values the commission has the utmost confidence and this confidence was not shaken, but rather strengthened, by the reports brought in behalf of the city, which caused a valuation to be made by an eminent engineering firm, whose findings confirmed the values submitted by the commission's engineers, although arrived at by different methods. The present depreciated value found by the city's engineers was somewhat lower than that determined to be the proper value by our own department, but this was by reason of the fact, as disclosed by the testimony, that the city's engineer applies to the various component parts of the plant a ratio of depreciation based on general averages met in investigation in some of the large cities of the country, among which

was the city of Chicago, and the percentage applied included as one of the strong considerations the depreciation resulting from obsolescence, inadequacy and public regulation which, it is well recognized, is much greater in large cities than in smaller cities, and part of which items do not enter into consideration at all in very small exchanges or in the suburban distribution system. The commission has adopted the depreciated value determined by its engineers for the reason that they have admittedly made a closer and more extended inspection of the property, a more thorough study of actual ages of the component parts and have a better knowledge of the physical condition of the property.

In order to further assure itself of the reasonableness and accuracy of the results obtained by its engineering department, the commission called in the chief telephone engineer of the Wisconsin commission, one of the oldest and strongest public service regulating bodies in the central states, whose opinions are recognized and quoted, and have the respect of the entire country. This engineer made a careful and painstaking examination of the entire valuation made by our own engineers, checking in detail all of the items in the various component parts thereof, checking the unit prices and in fact the whole fabric which produced the result, and except in that he suggested a slight revision upwards in one item and downwards in another, which variations practically counterbalanced each other, he had no criticism to make of the valuation, but assured the commission, both in consultation and on the witness stand during the hearings, that the results obtained by our engineering department met with his full approval, and that they were as nearly correct as it was possible to determine."

In a summary of the remainder of the commission's finding, as made by the Nebraska State Journal, it is stated that the commission says that but one error of considerable moment was discovered and corrected, but there can be no suspicion of others because of the thorough check which finally resulted through the comparisons made. On the question of overhead or general expenses, which was fought over at considerable length, the commission insists that its percentage of 17.2 per cent. is conservative.

The commission says that when Great Britain took over the telephones of the kingdom, this item totalled 26 per cent. Various methods of computing this are in use by other commissions, part of it being concealed by including it in the unit of costs. In the case of the Wisconsin commission, which was quoted during the hearing as allowing only 12 per cent., it is contended that in fact it allows from 19 to 25 per cent. and quotes from a recent address of Commissioner Erickson to that effect.

Nothing Allowed for Good Will.

The commission declines to allow anything for good will, holding that this would appear too much like asking the public to pay in perpetuity for the privilege of making free gifts to corporations. The commission admits that the company ought to have an allowance for working capital and that its figures are $39,000 short of a reasonable allowance but gives no reason why it does not allow it. It also trims the allowance for advance construction, that is idle property, declining to permit any interest to be earned on the portions made idle by the consolidation. The value finally adopted by the commission includes only the plant in actual service, even cutting out the cost of financing.

The company contended that it is entitled to earn a return upon the reproduction new value of its property plus the going concern value, defining this latter as that value which is produced through the cost of establishing the business. The commission says on this point: "Many of our regulating bodies are recognizing and giving consideration to such values. This commission, while recognizing that this element may have a proper place in the basis of values for rate making, under certain conditions, which would necessarily vary with the history of every corporation coming before it, is not yet prepared to accept it. The increase in revenue prayed for by the petitioner does not require that this need, at the present time, be taken into consideration, and the commission will withhold its views on the subject until it shall have more fully analyzed the fundamental principles and various theories on which such values should be based."

The commission says that the physical valuation made by its engineers was in strict accord with the law, followed the methods in other jurisdictions and that sanctioned by the federal law, and eliminates all consideration of stocks, watered and otherwise.

Statement by the Company.

Officials of the Lincoln Telephone & Telegraph Co. have issued a statement regarding the finding of the commission which is in part as follows:

"The increase in rates allowed by the commission was not as large as we believe the showing made entitled us to, but we shall accept it as embodying the best judgment of the commission after a long and exhaustive investigation on its part. The request for an increase was filed six months ago. Ample opportunity was given for every objector and every conflicting interest to present whatever evidence was available. We filed the reports of our own engineers and accountants, and these were checked up and compared by the engineers and accountants of the commission with the results of their own independent investigation—and both by specially employed and qualified experts hired by the city as well as the services of a telephone engineer from the Wisconsin commission. In addition, tests of all sorts with respect to the service and the equipment were made by representatives of the commission. Upon all this mass of evidence the commissioners have based their findings, and we shall make no complaint because these are not as we had desired them.

Neither the Automatic nor the Bell exchanges in Lincoln, when in competition, were making enough money to care for interest returns and depreciation, and after they were unified at a large expense and duplicate telephones were eliminated, a worse financial condition confronted the company.

At no time has the company been asking the community to pay any larger telephone bill as a whole than it did before the two exchanges were made one. All that we have been asking is that the company should have made good to it, by an equalization and adjustment of rates, the revenue it lost through the cutting out of all duplicate service. The investigation has shown very clearly, taking even the closely-pared figures of the city's experts as a basis, that the new rates are not sufficient to cover all proper charges against the property. This makes it incumbent upon the company, in order to build the net income up to a satisfactory point, to add revenue through increased business and to practice many economies.

It should also be considered that ten years ago, when there were but 2,100 subscribers on the Lincoln exchange, the rates were practically the same as today and the service necessarily limited. Two years previous to the opening of the Lincoln exchange even four-party residence lines cost 25 cents a month more than the new rate for individual line telephones. Today seven times that number of persons can be reached with better service conditions prevailing, and nothing additional is charged for the increased cost of giving it.

The increase, it will be noted, is not very large, and in return for it the subscriber will receive more than double the service previously rendered. Before the two exchanges were connected subscribers were restricted in their communications with those who used the same exchange. These can now all talk to one another, and that the opportunity is utilized is shown by the fact that the total number of calls on the one exchange now is over 30 per cent. greater than the combined number on the two old exchanges.

Controversies such as the one just ended would have been avoided had not most telephone companies, when entering the business, guessed at what the rates should be. It is only within the last few years that it has been possible to arrive at a proper rate by following rules that are grounded upon an indisputable scientific basis. So that now when the people have taken over the control of rates through properly constituted bodies, they not only have the power to find and enforce a just rate and to insist upon adequate service being given, but they have simple mathematical formulas to follow in reaching a decision, and any one can check up on them to see if they have erred. It has been through the exercise of this authority that the new rates have been established, and by this means it is made clear that no one is being required to pay more than is right.

A limited service to a few hundred telephones entirely within the city can be given at a lesser rate than service to 14,000

telephones within eight cities and villages and spread over the intervening country can be given. This is due to the fact, not generally understood, but which was amply established at this and other hearings, that the cost per station for operating a telephone system increases with the growth of the business, and, in the case of the Lincoln company, has made the investment and expense per telephone much greater than when the system was first established.

The unit of cost in the telephone business is not the instrument upon the wall but the service that is furnished in connection with it. The company does not rent telephones, it sells service. The wider the area of service the more it costs to give it, because of the increasing construction and maintenance costs. The larger the number of telephones on an exchange the costlier the equipment, for the reason that every new line must be available for connection with every other line, and the amount of the exchange equipment required increases in a much greater proportion than does the number of lines. The same ratio of increase is represented in the operating costs because of the multiplied number of connections, the increased number of operators and other employes, the greater wear and tear and the greater superintendence and maintenance costs. These increased costs must be borne by the exchange as a whole, and as the revenue derived is from the sale of service represented by the monthly charge for each instrument, this increase must be borne by all subscribers, graded according to the value of the service rendered each.

It is generally conceded that one large element of value in telephone service lies in the number of persons who may be reached for business or other purposes, following the same rule that makes advertising in this newspaper more valuable to the advertiser the greater the number of subscribers secured. If this theory were applied to the matter just passed upon by the commission, the rates permitted would be much greater than the commission has fixed them. The experience of the last few months demonstrates beyond dispute that subscribers do take the opportunity offered to enlarge the use of the service they buv."

Illinois Latest State to Have Public Utilities Commission

Governor Dunne on Signing Bill Says New Law Better Than Wisconsin Act—Gives Reasons—Regrets Defeat of Home Rule Feature, But That May Come Later—Law Provides Municipal Ownership Alternative—Summary of Provisions

Governor Dunne of Illinois has signed the measure passed by the recent legislature abolishing the state railroad commission and establishing a public utilities commission of five members at a salary of $10,000 each. The act becomes effective on January 1, 1914. The commissioners are to be appointed by the governor for graduated terms to provide for an ultimate term of service of six years, with not more than two appointments in any year. Not more than three members are to be of the same political faith. The commission will have a secretary, attorney, accountants, engineers and other employes.

The new commission has general supervision of all public utilities, including telephone and telegraph companies, and is charged with the examination of franchises, capitalization, rates and other charges and of the service rendered.

Governor Dunne on Home Rule Defeat.

In signing the bill Governor Dunne expressed regret that the general assembly had seen fit to strike out the home rule clause which would have enabled the city of Chicago and all other cities in the state, if they so elected, to govern and control their own utilities, a feature which, he said, he had consistently supported. Even shorn of this provision, however, he thought the bill a meritorious one. He thought it even better than the Wisconsin law, which has been regarded as a model, in that it eliminates the features of that law which give the Wisconsin commission control of publicly owned utilities and gives private corporations in Wisconsin indeterminate franchises. So far as home rule is concerned he said that if public sentiment in its favor crystallized sufficiently to influence the next legislature a home rule clause could then be added to the law. As a warning to public utility companies and in the way of reassurance to municipalities desiring home rule, he referred to the provision of the law which exempts from the jurisdiction of the commission public utilities owned or operated by municipalities. He said that if commission control did not work out as expected, the alternative would be municipal ownership.

All public utilities affected by the new law are required to furnish the commission with all information, documents, accounts and records desired by the commission and to obey the orders of the commission.

The commission has power to establish a uniform system of accounts, to classify utilities for accounting purposes and to prescribe the manner in which accounts shall be kept. The system of accounts established shall not conflict with those of the Interstate Commerce Commission. Such accounts shall distinguish clearly between payments for operating expenses and those for new construction. Utilities may be required to keep such accounts as will "adequately reflect depreciation, obsolescence and the progress of the arts." The commission may fix the rate of depreciation.

Annual reports to the commission shall be made by the utilities in the form required. Monthly reports of earnings and expenses must be given if asked by the commission; also special reports where demanded. All reports shall be under oath.

The commission is required to supervise the issuance by public utilities of stocks, stock certificates, bonds, notes and other evidences of indebtedness. Securities sanctioned by the commission shall be identified as such. For certain specified purposes the utilities may issue securities after securing permission from the commission. Such purposes, usually, shall not be such as are reasonably chargeable to operating expenses or income. The bill provides in detail for a rigid investigation by the commission when application is made to it for authority to issue stocks or bonds. If necessary, an adequate physical valuation may be made.

The proceeds of the sale of securities must be applied as required in the commission's order. Notes running not longer than twelve months may be issued without the consent of the commission, but cannot be converted into stocks or bonds, or renewed for a longer period than two years, without consent. In case of merger the commission may not approve a capitalization exceeding the sum of the capital stock of the consolidated corporations at par plus any additional cash actually paid for improvements. Severe penalties are provided for the issuing of securities contrary to the provisions of the act. In the case of individuals a prison sentence of from two to ten years is imposed on conviction. The act is not to be construed as any validation or approval of past issues of securities.

The consent of the commission is necessary for the merger or joint operation of two or more utilities, or for the sale or lease of one to another, or for the transfer of franchises. Where merger is contemplated each company must file a petition setting forth all the circumstances, and the commission must decide, prescribing such conditions as it deems necessary.

No franchise shall be granted to any public utility not incorporated under the laws of Illinois, except common

carriers engaged in interstate commerce. No public utility now incorporated under the laws of another state shall be exempt from the provisions of the act by reason of the fact of such incorporation.

The commission has power to ascertain the value of the property of every public utility in the state and every fact which in its judgment may have a bearing on such value. It shall have power to make revaluation from time to time.

All rates shall be just and reasonable. Schedules showing all rates, charges and classifications must be filed with the commission and be open to public inspection. Without the consent of the commission these rates must not exceed those in effect on July 1, 1913. The commission has, however, power to fix rates in excess of those of the date mentioned or below them. Contracts between public utilities in relation to furnishing service or products must be filed with the commission.

No utility shall increase any rate without a finding by the commission that such increase is justified. Provision is made for a hearing on the propriety of any rate, either on complaint or on the initiative of the commission. Neither more nor less than the schedule rate shall be charged, nor shall there be any refunds or rebates. Discrimination between customers is forbidden. Differences in rates as to localities or classes of service must be reasonable. Specific provision is made for the fixing of rates by the commission, after a hearing, where it is found that existing rates are unjust. No telephone or telegraph company shall charge more for sending a message for a shorter distance than for a longer distance over the same line.

COMMISSION MAY ORDER PHYSICAL CONNECTION.

Every telephone and telegraph company must interchange with every other with which a joint rate has been established or with which a physical connection has been made. Physical connections between two or more public utilities may be ordered by the commission after a hearing. The conduits, subways, tracks, wires, poles, pipes or other property of one utility may be used by another if the commission finds such joint use of public convenience or necessity and also that it will not result in substantial detriment to the service of the first utility. This, however, does not apply to utilities mainly or primarily within a city.

No utility shall begin the construction of any new plant which is not in substitution for any existing plant or an extension thereof without a certificate of public convenience and necessity from the commission. No new utility shall transact business without obtaining such a certificate, and rights given by such certificates must be exercised within two years.

Reports of all accidents must be filed with the commission. If the accident causes loss of life or limb, the utility must give notice of the fact immediately to the commission, using the speediest means of communication. The commission may investigate accidents, but neither the report from the utility nor the findings of the commission shall be admitted in evidence in any damage suit. Safety appliances may be ordered.

All hearings shall be in public. Commissioners may issue subpoenas, compel the attendance of witnesses and administer oaths. No subpoenaed witness, testifying under oath, shall be subject to any penalty for anything he may divulge. Neglect to appear under subpoena is a misdemeanor. The commissioners and their duly accredited agents have the right, at any and all times, to inspect the papers, books, plant and equipment of any utility. When complaints are filed with the commission a copy shall be served on the utility. Utilities themselves can make complaints as well as citizens, societies, municipal corporations or others. Hearings may be had on complaints and rehearings if sufficient cause appears.

Appeal from the decision of the commission may be taken to the circuit court of Sangamon county. No new evidence may be introduced on appeal. From the circuit court the case may be appealed to the supreme court. The headquarters of the commission will be at Springfield, Ill.

The Telephone An Effective Business Getter.

The accompanying illustration, reproduced from an advertisement carried in the Chicago newspapers, shows how a proper appreciation of the utility of the telephone has enabled one dealer to make a most unique and effective appeal to prospective patrons. Nearly every one realizes that the telephone has become an indispensable convenience but here is a florist who has quietly established an agency in every home and place of business that has a telephone by the simple device of playing up the telephone as a distance and inconvenience annihilator.

325,000 Wittbold Service Stations in Chicago

For Sodding and Grading, Landscape Gardening, Shrubs, Plants, Palms, Ferns, Cut Flowers and Decorations.

We're as near to you as your phone. And every telephone is a Wittbold Service Station.

Hundreds of orders flash into our private exchange every day from every part of Chicago, from the suburbs, from nearby states.

Just step to the nearest telephone and call **Graceland 1112**

THE GEO. WITTBOLD CO.

Wittbold FLORIST

737 Buckingham Place (Near Evanston Ave.)
1309 North Clark St. (Near Goethe St.)

Advertisement Claiming Every Telephone a Selling Agency.

Proposed Stock Issue of Michigan State Telephone Co.

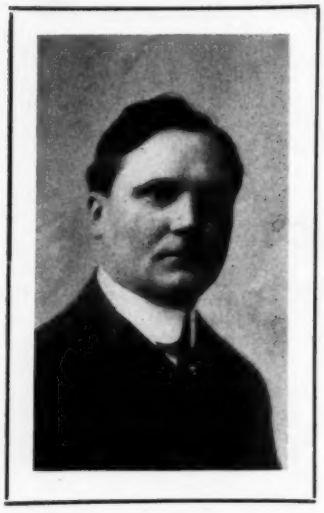
Application has been filed with the Michigan Railroad Commission by the Michigan State Telephone Co. for authority to sell $3,250,000 stock with which to recompense the American Telegraph & Telephone Co. for cash furnished with which the state company purchased the Home Telephone Co., of Detroit, and other telephone lines. The authorized issue of stock of the Michigan State Telephone Co. is $6,000,000 common, and $4,000,000 preferred. The application sets forth that the company desires to sell $2,500,000 of common stock and $1,715,000 preferred stock for the purpose of refunding to the American Telephone & Telegraph Co. the money for taking over the Home sys-

Receiver for United Telephone Co. of Boston.

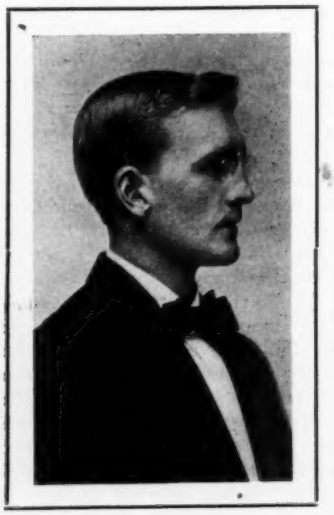
On a petition of creditors Referee Olmstead in the United States bankruptcy court at Boston, Mass., has appointed James L. Hilliard receiver for the United Telephone Co., of Boston. This company recently filed a voluntary petition in bankruptcy, disclosing liabilities of $29,265 and assets of $522.

A Quartet of Men Prominent in the Telephone Field

BASIL L. BULLMAN, receiver and general manager of the Marietta Telephone Co., Marietta, Ohio, was born at Wick, W. Va., in March, 1876. He attended the village school until 15, took a four-year course at Wheeling, W. Va., and spent 1½ years at business college. He then spent eleven years "shooting trouble" on the telegraph lines of the Standard Oil Co. and was promoted through all the different divisions of the company, having charge for several years of construction and maintenance of the telephone and telegraph lines in Ohio and West Virginia. He engaged in private business until about seven years ago, when he went into the construction business, built exchanges and took charge of construction and maintenance of toll lines for two companies in Ohio and West Virginia. He was appointed receiver at Marietta in 1910. Mr. Bullman is a director in the new United Independent Telephone Association of America, a director of the German National Bank at Marietta and has other private interests. He is a 32 degree Mason, a Knight Templar and a Shriner.



CHARLES ELLIS HESTON, who has recently entered the employ of W. N. Matthews & Brother, St. Louis, Mo., as sales manager of the telephone department, was born at State College, Pa., Feb. 9, 1883, and was educated at the Seattle, Wash., high schools, South Dakota Agricultural College at Brookings, S. D., and University of Wisconsin, College of Engineering class of 1905. He was with the Dakota Central Telephone Co., South Dakota, 1899-1900 as lineman and exchange manager; 1900-01 with Chicago Telephone Co., as switchboard manager; summer of 1903 manager of Brookings Telephone Exchange, Brookings, S. D.; summer of 1904 with engineering department of Wisconsin Telephone Co., Milwaukee, Wis.; 1904-10, War Department as electrical engineer in charge of electrical installations at New York, Potomac river, Puget Sound, Manila, Philippine Island harbors and sea coast fortifications; 1911, salesman with Tower-Binford Electric Mfg. Co., Richmond, Va., and from 1911 to spring of 1913, with Stromberg-Carlson Telephone Mfg. Co. as salesman.



E. O. Turner, just resigned as manager of the Illinois Telephone Co., Roodhouse, Ill., was born near Athensville, Ill., in March, 1873, and was educated in the rural schools, the Scottville high school, and the Western Normal College at Bushnell, Ill. He has since taken up a telephone engineering course by correspondence. Mr. Turner worked on the farm until 20 years of age and then engaged in the furniture and undertaking business at Scottville and Modesto, Ill., until 1903 when he built the telephone exchange at Scottville. He operated this exchange until 1907, when he sold it and moved to Jacksonville, Ill., where he served for one year as construction foreman for the Illinois Telephone Co., after which he was made manager of the Whitehall, Ill., exchange for the same company, and later, also, of the Roodhouse exchange, but resigned in December, 1910, and bought part interest in the exchange at Tarkio, Mo. In April, 1912, he became manager of the Illinois Telephone Co. at Roodhouse. He resigned in June, 1913, to become general manager of the Whitehall Ice & Coal Co., Whitehall, Ill.

KARL B. DAVIS, half owner and manager of the Middletown Telephone Co., Middletown, Ind., was born at Middletown in December, 1877, and was educated in the grammar and high school in his home city, class of 1897. He manifested a liking for electrical matters, and since the town needed a telephone exchange his father installed one and placed his son in charge. Mr. Davis finished school on April 23, 1897, and the exchange was opened on May 5. Attempts had previously been made by others on three occasions to start a telephone exchange in Middletown, a town of 1,500 people, but none of these ventures had succeded. Mr. Davis started with 44 subscribers and the business has steadily grown until the company has about 300 subscribers, and after moving its central office three times is now in a modern, up-to-date home of its own. Mr. Davis is a member of the Indiana Independent Telephone Association, has stock in the Indiana Toll Clearing House and attends all the national conventions. He has membership in the Middletown Commercial Club, the Independent Order of Odd Fellows and belongs to the Masonic lodge of Middleton, Ind.

Some July Thoughts

Fifty Years Ago Today—Some Side-Lights

By J. C. Kelsey

Fifty years ago today was the climax of a distressing week. Pickett's charge had been made with the usual ferocity, and Lee with broken cohorts was retreating through the silent night into Virginia.

The fearful carnage of four days was at an end. The victorious army did not pursue, for it had so many bruises and sores that pursuit was impossible. The victors merely gave a sigh of relief that the invading army had retreated.

The army of the Potomac, the flower of the Southern forces, was invading the enemy's country. In fact, the outriders had spurred their horses to the very toll gate of the Harrisonburg bridge.

Just why General Lee made this useless conquest with its bitter defeat he never explained. Possibly he was ordered to do it by a board of strategy.

Armies, as well as great business institutions, are forced hither and thither into absurd positions by boards of strategy!

Well-fed, well-meaning and sleek gentlemen, who never put an active hour in the field, sit at the checker-board safe from shot and shell—of course knowing it all!

It is a mistake to think that God has quit handing down special instructions since Elijah and Elisha, because some human beings apparently get their information straight from Heaven. There is no other place they could get it.

Anyway, General Lee was in the enemy's country. As with the "Six Hundred," it was not for him to wonder, but simply do what he was told to do. And so they met at Gettysburg!

Today they meet again, 50 years afterwards. Isn't it wonderful that 50,000 survivors should assemble to commemorate this awful battle field?

Why they did not all die 50 years ago is the greatest mystery of all.

Peach orchards and wheat fields became famous in a day. The devil's den and the bloody angle became immortal, because men, and brothers at that, tried to slay one another in a mighty passion.

Had General Lee stayed at home he would have avoided Gettysburg, the belligerency of the South might have been recognized, and I might have needed a passport to have attended the Mississippi convention last week.

But hind-sight is a wonderful faculty. We can all easily say "it might have been."

Foresight is a natural monopoly, still held by a higher power and human beings have no chance of gaining it.

Some men guess right, but it is purely accidental. The most natural thing in the world is for a man to guess wrong.

Had human beings foresight, and General Lee his full share, there would have been no Gettysburg; but there would have been no war because the framers of our constitution would have avoided the causes which led to the war.

Had King George known, possibly there never would have been any Revolutionary War.

The world would be no better off if there was such a thing as foresight.

Thoughts of war always lead me into the telephone business. The telephone was conceived of war.

Two men, only a few hours apart, entered the patent office with identical ideas. Then the Western Union and the Bell companies had hostilities. Finally, all paled into insignificance, when Independent telephony came into existence.

Independent telephony was an outgrowth of a demand for telephone service which could not be satisfied in small localities. Bell telephone was a natural big-town activity, yet the service was limited and costly.

The telephone war began when the two forces started to invade each other's territory. The Bell had the big towns first. The Independent companies had the small towns first. Had they each stayed in their respective loaclities, there would have been no war with its terrible waste.

But the human beings who controlled the Bell company did not have foresight, naturally; and no division of territory was recognized nor even considered, until they were forced to recognize their economic weaknss in the small locality.

Consequently, they moved out and made connecting agreements.

Nothing would be more ridiculous than organizing another telephone company to give service, for instance, in New York City.

Nor would it be any the less ridiculous for the Bell telephone company to build a comprehensive telephone system among the small towns and farms of a Kansas community or any other locality.

All this had to be learned from bitter experience—not from foresight.

I am in a somewhat warlike mood today, after reading an Elbert Hubbard story entitled "Our Telephone Service."

Of course, the pamphlet must be paid for by the Bell company. No human being would pay 10 or 15 cents for such a copy.

I suppose I am foolish to quarrel with the prolific Hubbard. But even a cat may look at a king!

His story is so flagrantly wrong, in so many ways, that some of his statements can not be passed by without analysis.

I wonder just how much was paid for this artistic "bunk."

The worst part of it is that a New York financial house is sending the booklet out, apparently hoping that it will fall into the hands of a sentimental old-maid school teacher or preacher, with a dollar to invest in a great, spiritual cause!

What interested me most was this statement:

"If, by chance, some financial tidal wave should wipe these 15,000 home companies out of existence, between the evening twilight and the dawn, it would scarcely create a ripple of disappointment save among those who own or operate them."

Oh you Elbert! You of artistic temperament! You who have tasted of so much forbidden fruit and who are so generally wise! If all your writing is as unreliable as some of this, I feel sorry for its perpetuity! Only truth survives and goes swinging down into the distant future!

Lies, innuendos and unjust statements are eliminated, just as the barnacles of a ship necessarily must be.

It will do no good in these columns to make answer. You who read intelligently know that the Bell company has 5,000,000 stations instead of 7,000,000, as Mr. Hubbard puts it.

Five million stations are enough to be proud of.

Nobody but a feeble-minded man, or one with criminal in-

tent, would say that 3,000,000 telephones, earning $100,000,000 annually on an investment of $500,000,000, as he puts it, could be wiped out of existence "between twilight and dawn, without a ripple of disappointment."

Of all the damphool statements, if I may use that expression, this holds the medal! In fact, I am surprised that the Bell company would countenance such a statement.

The Bell company today connects with two million and a half Independent telephones and is proud of it.

Out of that 15,000 telephone companies not more than 250 of them come into actual conflict with the Bell company. Could any man imagine that these 14,750 Independent telephone companies, giving good service to a satisfied public, be wiped out on Saturday night "without a ripple of disappointment?"

Does this Hubbard person presume to say that the Bell company would be glad to lose these connections over night?

Does he realize how fearfully hard the Bell company has worked for over three years to connect with these nearly 3,000,000 telephones? And then to have it all disappear in one night!

O shucks!

In another place we learn that some "gazaboo" talked to every governor in the United States from a Chicago pay station during the presidential convention.

You know full well how hard it is for an ordinary Chicago business man to talk even to a Dayton man, and that there are countless states where there is no telephone connection with Chicago.

Yet the proletariat, as this Hubbard person contemptuously styles him, is being led to believe that the Bell system is so vast that you can talk to every governor in the United States and Alaska!

My biggest disappointment in this story is the awful lack of originality. As I read along, I detected familiar things with the Bell press bureau trade-mark upon them. But really, I was not prepared for a diatribe on that terrible animal known in natural history as "the promoter."

How familiar is its tone!

There is no doubt that it comes directly from the Boston catechism.

We learn that almost every Independent stockholder has been literally blackmailed into being one. You know that "blackmail" is a pretty ugly word.

We learn, too,—more original dope—that promoters take their pay in stock,—and further, to our shocked surprise, make money through a construction company.

I would like to know what is original about this. Show me a prominent railway man with considerable wealth, who got it any other way.

I simply can not understand why the promoters of telephone companies should have any greater virtues than the promoters of gas companies, electric light or railway properties.

And now follows the deadly secret! We learn that Independent properties were built to sell! And that the Bell company is buying them so swiftly that it does not take "much of a prophet" to see that eventually one telephone company will have it all.

What a pity that some one has not told him of the countless counties where the Bell company has either sold out or has entirely deserted the field!

I have bought land to sell, and we all have something to sell. Even Mr. Hubbard gets out a magazine to sell!

I don't see how people can be blamed for selling a telephone company if they can get their price and want to do something else. Why pick on telephone companies for this freak of human nature, applicable to every walk of life?

All the time, I am wondering just who is going to be reached by this costly pamphlet. I am wondering just what good it will do—and what the excuse is for all this "bunk."

Is the public really interested in a billion dollar corporation because its president has known poverty, sorrow, loss and misunderstanding?

Who hasn't had these items since the time of Adam? Even Adam knew sorrow, poverty and loss—and he never was understood.

Other people love chickens, horses and good roads!

I don't believe you can find an Independent telephone manager who doesn't, nor one who doesn't love children. Nor one who would hesitate to pick up school children on their way to that little red school-house!

I think all these attributes are grand—and I have seen promoters who possess the very same ones.

I do not even deny that a man at the head of a billion dollar company is likely to be well nourished and generous. I think it is going pretty far to surround a man with a halo, based on the emotions enjoyed by nearly a billion and a half people!

I have no fault to find with that steam yacht story. It is none of my business. Neither is the loyalty stuff.

Organizations, both great and small, are ever a curious combination of loyalty and treason. It is human nature.

Personally, I think it is foolish for any man to ride in a smoker or in a day coach. It is dangerous. It is suicidal, especially on the New York, New Haven & Hartford, according to the newspapers!

It is not even safe to send section-men on a smoker!

It is grand to surround commonplace things with romance. I would like to believe in fairies myself! But I belivee there are very few investors who believe in fairies by this time.

There are beautiful things connected with telephone history.

We all sympathize with Mabel Hubbard and her affliction.

Everything in the world worth while has had humble or simple beginning. Even the steam engine began in a humble kitchen.

The early history of the telephone is very interesting. To think of a man trading the exclusive territory of New England, now so valuable, for the exclusive right to lecture on the telephone, seems even ludicrous.

I like to read the pioneer's speeches and delight in them, but I do object to mixing it up with down-right misrepresentation.

If you are after a man with libelous statements, start out with them and finish with them.

Give us the castor oil straight!

Before I close this hot summer day ramble, I want to give you a little more Hubbardism:

"Hell—Three telephone systems in one town.

"Purgatory—Two telephone systems in one town.

"Paradise—One good telephone system."

Now, I can't recall a locality where there are three legitimate telephone systems in actual competition.

I can't recall cities where two telephone companies exist where both companies are not over-taxed to carry the load.

I know of places where the Bell company owns its competitor and does not dare to eliminate it because neither company's equipment can be spared.

And worst of all, I can't find a single place where either manager or subscriber will even admit that a single telephone system is a paradise!

I just want to repeat that there are not even 250 localities that have more than one legitimate telephone system.

I am only disappointed in the failure of an idol to stay

on his pedestal. I know it is very presumptious to criticize him in print.

If he is as wrong and unjust in his other writings as he is in this telephone story, I can see his finish! Biased literature is not a permanent meal ticket.

After all, I don't blame any one but the Bell press bureau.

Say! why not chloroform the "bunk" or the bunk artist? It would be a very interesting summer diversion.

The telephone is a Jekyl-Hyde combination. It has its lines of beauty and honor, and it has some great yellow streaks!

Not every human being has been justly treated in telephone investments, in either Bell or Independent circles. There are numerous sore spots. But, I pray you, what phase of industrial existence is any different?

Why should Independent telephone interests be different, or be expected to be lily-white, when no one else is? Remember the mote and the beam!

I am accustomed to halos about the heads of apostles, prophets and saviors. It is sadly out of place about the head of an industrial official!

MORAL: Keep out of the sun!

Tri-State Independent Telephone Convention.

The accompanying illustration is from a photograph taken at the recent convention of the Tri-State Independent Telephone Association at Corinth, Miss., the proceedings of which were reported in TELEPHONY last week. This view, which shows some of those in attendance at the convention, was received too late for publication with the report of the meeting, but it tells its own story of the up-to-date men who are in charge of Independent telephone interests in Mississippi, Tennessee and Alabama.

Bremen, Ind., Exchange in New Home.

The Home Telephone Co., of Bremen, Ind., held "open house" for its friends in that vicinity one evening recently. The event was the formal opening to the public of the company's remodeled exchange in the new building just completed. The new home is a handsome one, comfortable and convenient as modern methods can make it.

The entire system at Bremen has been thoroughly overhauled and remodeled. Nearly a mile and a half of fibre conduit and 3,050 feet of cable have been placed underground in the business district, replacing the old aerial system. The exchange has been moved into commodious quarters, with light, clean, roomy offices, public booths and a large store room and repair shop. A new Cook distributing frame, mounted with Cook's protectors, has taken the place of the old terminal rack. A Monarch toll board, conveniently located with a public window and public booths, has been added to the equipment. In fact, every possible aid to better service has been adopted.

Charles E. Koontz has been manager of the company ever since it started in business fourteen years ago, and in that time, under his direction, the exchange has reached a place among the best, of its size, in northern Indiana. The fact that over half of the population of Bremen inspected the new exchange and partook of Mr. Koontz's hospitality on the night of his "open house" is evidence that his efforts are appreciated, and that the enterprise will continue to grow and to succeed.

Samuel Tomlinson ,of Plymouth; Wm. Pogue, of Columbia City; W. W. Hans, of Laporte; J. W. Scott, of Warsaw; and C. R. Stoops, of Napanee—all managers of exchanges of their respective cities, were present and expressed deep admiration for the work the Home Telephone Co. has accomplished.

Group of Telephone Men at the Recent Convention of Tri-State Independent Telephone Association, Corinth, Miss.

Queries on Theory and Practice

Data on Incommunicating Telephone Installations.

"What is the calculated average length of multiple cable required between intercommunicating telephone sets for (a) compact factories and business premises; (b) scattered factories and business premises; (c) hotels and large residences? What would be considered fair time for labor allowable in these cases for say 12- to 20-line sets?"

The Stromberg-Carlson central energy Intercom-Phone system will operate satisfactorily, it is claimed, up to 800 feet between stations. For systems covering a greater area the company recommends a magneto system.

In installing a system of this kind, it is the Stromberg-Carlson's custom to consider and figure one man's labor for two days for each station.

Locating Toll Line Trouble.

"The article by James Cavers, in TELEPHONY May 31, is of great benefit to me, and I would appreciate it if he would give in an early issue of TELEPHONY, a method of testing a case of toll line trouble as follows: Two physical circuits composed of No. 12 N. P. S. copper wire upon which is built a phantom circuit. Assume one side of one of the physical circuits broken and, one end of the broken wire grounded at the break but the other end clear, as shown in the diagram (Fig. 1).

"I am very much interested in Wheatstone bridge measurements having to locate troubles on a number of circuits in a large territory but know of no method of locating a case of trouble described."

In any regular test on the side circuits of a phantom, the repeating coils at each end would be taken down, so that the faulty circuit could be dealt with by itself. The conditions, under the circumstances referred to, would be as shown in Fig. 2-*A*. In such a case the Varley or Murray methods of testing would not be applicable but, if the Wheatstone bridge is equipped for capacity testing and a suitable galvanometer is used, a location can readily be obtained.

As many testing sets are not equipped for capacity testing, another method, using a sensitive voltmeter, will be described. Consider Fig. 2-*B* where a voltmeter, battery and plugs are connected to a six-point key. To make the test, first have line opened at point *A*, Fig. 2-*A*. Then connect one plug to ground and insert the other in the jack connected to bad side of line. Depress the key and then release it and note the deflection shown on voltmeter. Repeat this three or four times, in each case keeping the key depressed for about five or ten seconds, and take the mean of the various results. The good side should then be tested in the same manner. Assume that the line is 45 miles long and that the deflection in the first case

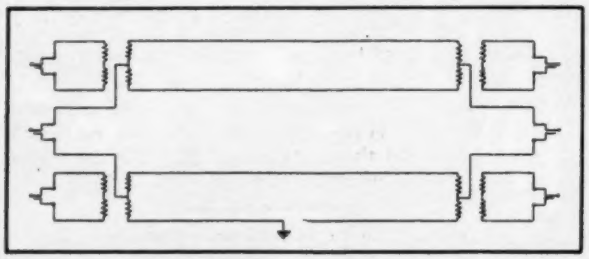


Fig. 1. Diagram Showing Ground on Phantomed Circuit.

was 10 and in the second 20. Then the distance to the break in miles, is 45 times 10 divided by 20, this being equal to 22.5 miles.

The rule for this is to multiply the length of the good wire by the ratio between the bad wire and good wire deflections.

The deflections due to any cable in the circuit must be allowed for and the insulation of the line tested must be high.

In the case shown in Fig. 2-*C*, where the ground is towards the tester, the line should be opened at point *B*, and a test taken on the good wire. Then at point *B*, the

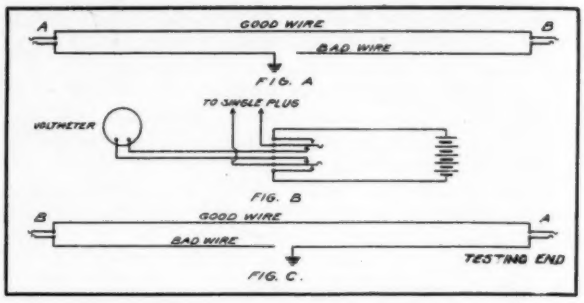


Fig. 2. Conditions for Testing.

wires should be short-circuited and a test again made over the good wire from *A*. The second result will give the deflection due to the good wire and the portion of the bad wire from *B* to the break. By simple calculation, the distance to the trouble can again be found as check upon the first determination.

An ordinary wire chief's voltmeter will be satisfactory for the tests referred to but the more sensitive it is, the better. Say that the voltmeter has a 40-volt scale, the battery required to get accurate results would be about 100 volts. The battery is not connected to the voltmeter at any stage of the test, and, if proper care is taken, there is no danger of damaging the instrument.

The proper voltage can easily be determined by experiment. The main point is to get a deflection which will give accurate results. Thus, if on a certain line one got a deflection of only one degree for each four miles, one could hardly expect to get a location nearer than about four miles to the trouble.

It should be noted that the test is not applicable if there is much leakage on the line under test. The writer has proved that under normal conditions excellent results can be obtained.

Ground Connection at Subscriber's Station for Ringing.

"I would like to know what are the objections to a ground connection at the subscriber's instrument for ringing or signaling, or both. The Bell system used one side of line and the ground for ringing purposes but has abandoned the practice in later installations. I have looked up the matter in all the standard authorities on telephone practice but fail to find any valid objection to the practice."

The ground at the subscriber's instrument is objectionable on account of initial cost, cost of maintenance, and the difficulty of maintaining the lines in good balance so as to prevent noise. In the case of the Bell circuit using the ground for selective ringing, there is considerable leakage due to the grounded bells.

These reasons are sufficient to cause avoidance of ground connections at the substation unless necessary for the protective devices. It should not be necessary for talking or signaling of any kind.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Massachusetts Public Service Commission Act.

The supervision of telephone and telegraph lines has been transferred from the Massachusetts Highway Commission to the Public Service Commission, a new body created by the passage of the Washburn railroad bill. The new commission takes the place of the railroad commission of the state, but has more extended powers.

It has authority to initiate investigations as to rates, service and capitalization, and the law provides for the attendance of the board at state or federal hearings outside of Massachusetts. The new board may compel the attendance of witnesses, require the submission in evidence of books and papers, prescribe accounting forms and make valuations of properties. The board consists of a chairman and five members, one member of which will be appointed annually hereafter by the governor for a term of five years.

The membership of the board and the terms of service are as follows: Frederick J. McLeod, Cambridge, five years; George W. Anderson, Boston, four years; George P. Lawrence, North Adams, three years; Clinton White, Melrose, two years; and George W. Bishop, Newton, one year.

Special Master Files Report in Louisville Case.

Special Master A. G. Ronald, who was recently appointed by Judge Walter Evans of the United States District Court at Louisville, Ky., to make an investigation of the rates and charges of the Cumberland Telephone & Telegraph Co. in Louisville, has filed his report showing charges of $137,000 in excess of the rates prescribed by the city ordinance.

Judge Evans sustained a motion of City Attorney Beckley for a continuance of the hearing on an extended order of reference of March 13, 1913, and the hearing was passed to September 15. At that time if the United States Supreme Court has not decided on the city's petition for mandamus to require Judge Evans to order the distribution to subscribers of the sum collected by the Cumberland company in excess of the ordinance rates, a further continuance will be asked.

Advance in Los Angeles Rates Denied.

The council of Los Angeles, Cal., by unanimous vote has denied the protests filed by the Home Telephone & Telegraph Co. and the Pacific (Bell) system, of Los Angeles, and has approved for the ensuing year the telephone rates which have been in force during the past year. The board of public utilities had recommended no changes in the rates. In their protests the companies declared that the rates will not permit a just return on their investments. In denying the protests the council refused to grant a rehearing.

California Companies Merge.

The California Railroad Commission has granted authority to the California Telephone & Light Co., of Santa Rosa, Cal., which operates over portions of Sonoma, Mendocino, Lake and Napa counties, to purchase the properties of the Cloverdale Light & Power Co., of Cloverdale, Cal., for $75,000 cash and $50,000 in preferred stock. The commission also authorized the California Telephone & Light Co. to issue bonds to the amount of $350,000 for the purpose of paying existing indebtedness and of making additions to its facilities.

How Michigan Company Will Meet Tax Obligations.

As a result of the recent decision of the United States Supreme Court upholding the ad valorem tax law passed by the Michigan legislature in 1909, the Citizens Telephone Co., of Grand Rapids, will not only be required to pay back taxes under this law but will have to pay $24,677.89 interest on these taxes under the penalty rate of one per cent. per month. Other companies are also affected by the decision. President C. F. Rood, of the Citizens Telephone Co., has announced that the company will issue $750,000 of bonds to care for the accrued taxes, and a floating indebtedness of about $100,000. Action has also been taken to cut the dividend rate from 8 per cent. to 6 per cent.

It is declared, also, that the company is planning to raise its rates. Under the law now in force the company may raise its rates and if subscribers feel that they are charged too much they can appeal to the Michigan Railroad Commission. The burden is on the subscribers to furnish sufficient proof of hardship. After August 15, however, when the Bayliss telephone bill takes effect, the company will be required, before advancing rates, to advertise the proposed advance in newspapers in the communities affected and then file a schedule with the railroad commission. The law requires that in case protest is entered by the public the company must make a showing before the commission in support of the proposed rates and secure the commission's approval.

Petition as to Rates at Wichita, Kan.

The business men of Wichita, Kan., have filed a complaint with the Kansas Railroad Commission respecting the rates of the Missouri & Kansas Telephone Co. (Bell), which are declared to be exorbitant and in violation of the city ordinances. The petition requests that the commission order the Bell company to lower these rates to a reasonable figure.

The agitation regarding rates began when the Bell and Independent lines were consolidated in Wichita about two years ago. The complaint asserts that in every city where the lines of the Bell and Independent companies have been consolidated the Bell system now has a monopoly of the business. The complaint is said to be part of a concerted move against the Bell monopoly in Kansas, and it is asserted that intervening petitions will be filed in the general plan to induce the commission to establish a uniform basis of lower rates throughout the state, or especially in cities where there is but one system.

The Independent plant at Wichita was one of the first to be bought up by the Bell company. The Independent business rate had been $2.50 per month, while the Bell rate was $3. Since the lines have been consolidated the same class of service has been increased to $4 per month. The party line rate in Topeka is 60 cents greater than in Wichita, with about the same number of telephones in service in the two cities.

Pennsylvania Public Utilities Commission Act.

The Pennsylvania legislature has passed a public utilities measure, providing for a commission of seven members who shall serve for 10-year terms at salaries of $10,000 a year. The commission is given sweeping powers in the making of rates and the regulation of public service corporations, of which more than two dozen kinds are named as coming under the provisions of the act. It is said Governor Tener will sign the bill.

Practical Subjects—Letters and Discussions

The Guying of Poles.

Under the heading "Information Regarding Guying," Page 38, in the June 21 issue of TELEPHONY, this statement is made: "The lead on all anchors should be at least equal to one-third the length of the pole above ground and one-half when possible. Greater than two-thirds is not economical."

I have been figuring on the proposition and find that if the lead be equal to the height of the pole, the holding power of the anchor, against a straight away strain, will be 27½ per cent. greater, and the downward thrust on the pole will be 33 1/3 per cent. less, than if the lead be equal to two-thirds of the height of the pole.

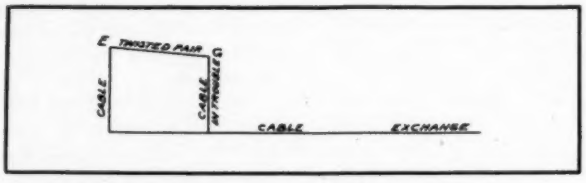
The additional length of guy strand required for the greater lead only amounts to about one-fifth of the height of the pole above ground. Therefore I cannot understand why the few cents extra expense for guy strand, when the extra lead is used, is not a good investment.

Gordon, Neb. W. F. Hankins.

Locating a Case of Trouble.

Being interested in the location of trouble, especially by the Wheatstone bridge method I submit a case which came under my notice a short time ago. A cable in the town in which the writer is stationed went out of order, all of the pairs being "wet." The first method of procedure was use of a cable tester of the wireless type, but, after passing the trouble a number of times, found the bridge method the only available one. As all the pairs in the one cable were bad, it was necessary to run a twisted pair from *E* to *G* as shown in the diagram, using the cable lead on the next street for the good pair.

After completing the good pair and measuring it, the result showed as follows; the first measurement of the good pair gave 200 ohms and the second measurement gave 187 ohms. From



Connections for Locating a Wet Cable Trouble.

these two measurements one side was found to equal 100 ohms and the other 87 ohms, the latter being in trouble. Connecting one side of each of the good and bad pairs at the distant end making a Varley loop test to ground (using 50 volts on bridge) the result showed a reading of 80 ohms in the rheostat. Then by using the formula

$$X = \frac{A\ L - B\ D}{B\ +\ A}$$

Where

A=resistance plugged in bridge arm A,
B=resistance plugged in bridge arm B,
L=total resistance of bad and good wire,
X=resistance to trouble,
D=resistance plugged in rheostat,

$$X = \frac{100 \times 187 - 100 \times 80}{100 + 100} = 53.5 \text{ ohms.}$$

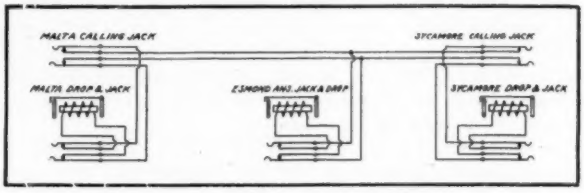
The resistance of 16 22 gage cable at 75 deg. Fahr. equals .01641 ohms per foot.

53.5 ÷ .01641 = 3260.2 feet distance from lower line post of bridge to fault which was found to be within a few feet of trouble. Considering that it is hardly possible to get a pair of open wires of the same length having the same resistance value, the writer considers the location a good one.

William E. Allen,
Mitchell, S. D. Dakota Central Telephone Co.

Carrying a Toll Line Through Intermediate Station.

The accompanying diagram shows the circuit used on our Sycamore, Esmond and Malta toll line, Esmond being between Sycamore and Malta. We put the toll line in on three jacks so that Esmond may use the line either way or Sycamore and Malta may ring through without bothering Esmond. Also if the line is out of order at either end the



Toll Line on Three-Way Ringing Through Jacks.

other end can still use it and will know between which towns the trouble lies. Perhaps this scheme will be of help to some one.

Sycamore, Ill. Thomas Allen.

Letters from a Retired Lineman to His Nephew.

Podunk Valley Farm.

Dear Ben:

The Glorious Fourth has passed and I was lucky enough to be able to drive for the troubleman for the two days immediately following. He cleared up several cases of trouble caused by bullets fired at the insulators. What an attractive target an insulator is?

But the Fourth was very tame, according to my way of thinking. When I was a boy, we had more fun in 20 minutes than the boys here had all day. In those days it was generally understood that a boy was a free agent for one day. We used to take part in the regular ceremonies up to a point when the flag was raised at the picnic ground, but we didn't "give a hoot" for the reading of the "Declaration" and the speech-making which followed.

We didn't have to wait until the marshall was out of sight before we let off a bunch of fire crackers like the boys do

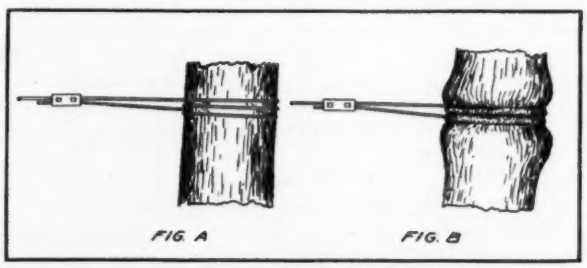


Fig. 1. A Tree Guy and the Effect on Tree.

nowadays; or we didn't live in fear of being jailed for scaring a team. Our fathers had gumption enough to watch their teams.

Yes, Ben, times have changed. We used to hear "Hip, Hip, Hip, Hurrah!" on the Fourth with Old Hurrah Rogers leading off. And Rogers had some voice, let me tell you. At one time

I remember I arrived at the conclusion that I would rather be able to cheer like him than be president.

I remember one very great disappointment, however. General Grant, then president, was to be present at the annual celebration. Now, all the pictures I had seen of him had been about three or four times the size of pictures of other men in our album so I presumed that he was three or four times larger than my father, for instance. I had also entertained the idea that the reason father wasn't president, was because he was too small in stature.

Well, when President Grant was escorted to the platform, I was quickly disillusioned and mightily disappointed. Yes, sir, he was the smallest man on the speakers' stand.

Two other incidents happened to mark that day in my memory. It was the day we effectually disposed of "Old Betty"—unintentionally, too. "Old Betty" was a log-like relic of a cannon from the field of Gettysburg. She was hauled forth on all important occasions, and caused to boom the glad tidings of whatever day it might be.

On this Fourth, two other boys, Bob and Tinker, and myself, rode to the picnic grounds on the wagon hauling the cannon. During the trip, Bob stuffed my linen jacket into the gun. I couldn't get it out and forgot to say anything about it.

They took the gun to the edge of a steep bluff overlooking the lake and tried to fire a salute, but of course my jacket separated the priming and the charge.

After using up what powder they had, they put off the salute until more could be brought from the store.

When the men were gone, we boys concluded we'd roll "Old Betty" over the bluff. In our attempt we turned her end for end. A spark finally burned through my jacket to the charge and, just as the marshall chased us away, the old relic went off, kicked itself over the embankment and rolled down the slope into the lake. It settled out of sight into the mud, beyond all hope of recovery.

After that we roamed around in the background until we found the crate where the greased pig was imprisoned. It was just dinner time when we turned him loose. As soon as he was loose, we realized that we ought to catch him, and gave chase.

Folks were just arranging their picnic dinners in the shade. How many small companies that pig disturbed I don't remember, but he seemed to delight in devastating the white linen clothes and their contents. We were sharp enough to realize that no one knew that we turned the pig loose, so the thing went as an accident.

I got word yesterday from a farmer up the line about five miles, that he wants to cut a tree which is "wired to one of the telephone posts." I suppose it is a tree guy.

Guying to trees used to be more generally practiced than it

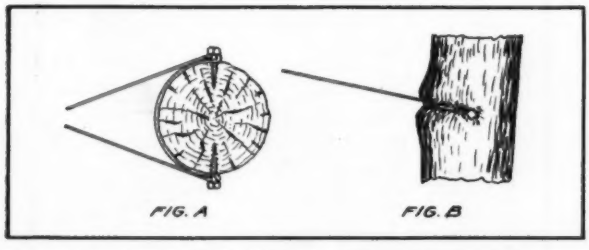


Fig. 2. Guy Which Stunted One-Half of the Tree.

is today. There is only one especial advantage and that is economy, in case the strand is properly attached to the tree. In the old days, hundreds of trees were choked to death on account of the strands being given one or more complete turns around the tree. This is about how it works out (Fig. 1). I've noticed a good many cases and set anchors to replace several. You see the strand has the same effect as girdling the trunk with an ax—cutting the veins and arteries by which sap is fed to the branches.

I recall a modification that one foreman used which resulted in one-half of the tree being stunted. It was like this (Fig. 2).

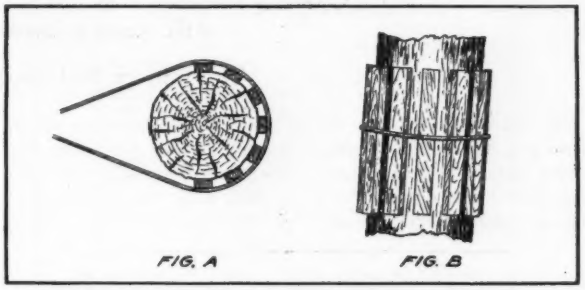


Fig. 3. Tree Blocks and Method of Wiring.

Two lag screws were driven into the tree on opposite sides of the trunk and the guy was attached as shown.

The combination of age and guy had a bad effect. Another way was to drive the lag into the back of the tree and bring the guy around one side only. Such an attachment was not strong enough to carry a heavy strain.

It is not safe to attach guys to limbs of trees in any case, and stumps are also poor anchors, though you will find instances where both have been used.

When attaching a guy to a tree, care should be taken that the clamp is not too close to the trunk. Leave the loop at least twice the diameter of the trunk in length.

In all cases tree blocks should be used. Blocks should be of hardwood and covered with preservative paint of some sort. The dimensions should be about 1¼ in. x 1¾ in. x 10 in., and should be placed in this fashion (Fig. 3) about 1¾ in. apart.

I have known of the blocks being held in place by nails, but nails should not be driven into trees. The blocks can be bound in place temporarily by a loop of iron wire, which can be easily removed when the guy is in place.

There is considerable argument in town about what breed of cats is the best for killing rats. All sorts have been imported, from the common Maltese to the tail-less Manx. Doc says the result will be a bob-tailed breed in a short time.

Uncle Dick.

An Operating Plan.

Traffic employes in the Chestnut Hill central office, Philadelphia, have devised several plans toward stimulating interest in operating work, says a correspondent of The Telephone News. Two of these are well worth noting:

All operators submit to the chief operator a written statement as to just how each thinks her particular work should be carried out to bring about the best results. The best of these comments are edited by the chief operator and posted on a bulletin board. These comments so far have not only been inspiring to the operating force, but have also been very gratifying to those in charge of the office on account of the splendid attitude expressed by the operators toward their work.

Eastern Pennsylvania Association to Hold Convention.

The first quarterly meeting of the Eastern Independent Telephone Association, which was organized last April, the complete account of which was published in the April 26 issue of TELEPHONY, will be held on July 15 and 16 at the Colonial Hotel, York, Pa. It is hoped the Independent companies throughout Pennsylvania and adjoining states will be represented as it is proposed to discuss matters of importance, including the public utility law.

Automatic Methods in Long Distance Telephone Operation

Conclusion of Article Descriptive of Equipment Used by Northwestern Long Distance Telephone Co. for Increasing the Operating Efficiency of Its Toll System—Paper Presented at Annual Convention of the American Institute of Electrical Engineers

By H. M. Friendly and A. E. Burns

In order to facilitate "rapid fire" service between Portland and Seattle, a distance of 185 miles (297.7 km.), an unusual traffic and circuit arrangement was devised. But one trunk circuit was available, a No. 8 B. & S. copper loop having no intermediate offices obtaining service over it. Since

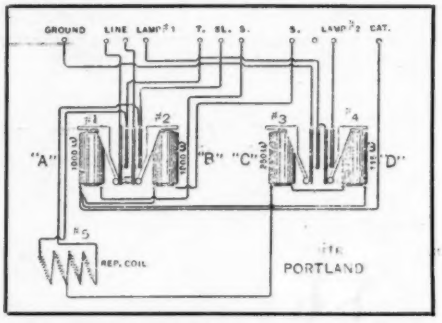


Fig. 4. Trunking Circuit From Toll Line to "B" Board.

many calls to Seattle were special or through calls to points beyond, it was necessary that the Portland operator should be able to signal the Seattle toll operator at will in the usual way without disturbing the Seattle *B* operator.

Following the regular line jack on the Portland switchboard is an auxiliary jack that may be called the *B* board jack which is used when the Portland operator desires to order up a number directly via the Seattle *B* board. The Portland operator upon plugging into this jack is able to speak directly into the head telephone of the Seattle *B* operator over the regular toll line without further preliminaries, and remains so connected until the *B* operator plugs into the called subscriber's line. Over the *B* board jack at Portland are placed two lamps which indicate by glowing that the Portland operator is not restricted by the Seattle toll operator, and further that she is in connection with the *B* operator's head telephone, and thus can proceed to order up the desired subscriber's line. The extinguishing of the second lamp indicates that the *B* operator has inserted the line or trunk plug into the local line jack. A lamp is placed over the jack of the line on the Seattle toll board, which by glowing indicates to the operator that the line is in use to the *B* board and is cut off at the toll board, the busy lamp being also lighted over the answering jack and its associated multiples.

The principle of operation (Figs. 4 and 5), is that the Portland operator by plugging into the *B* trunk jack causes battery current to be projected out on the line which operates a relay at Seattle, cutting the line into the *B* operator's head telephone set. The Portland operator then proceeds to ask for the Seattle number, just as a Seattle *A* operator would, specifying, however, "on 16," such being the number of the *B* plug associated with the toll line, as otherwise the *B* operator would not know what *B* plug to use.

This cutting into the operator's set is accomplished through the agency of relay *A*, Fig. 4, which is operated from the shell wire of the *B* board jack. The current flows through two relays in series, relays *C* and *D*. Relay *C* is adjusted to operate through a resistance of 4,000 ohms, while relay *D* will not operate through a resistance of over 2,000 ohms, which gives a margin of adjustment that is used to give supervision in the following manner: If the switching apparatus is on the line, that is, the Seattle toll operator has no plug in the line jack, relays *C* and *D* pick up and light the supervisory and guard lamp associated with the Portland *B* board jack, assuring the Portland operator that she has the circuit to the Seattle *B* operator's head telephone set.

This same current operates relay No. 3, Fig. 5, which controls relay No. 2, a cut off relay which disconnects the toll switchboard, lighting a lamp over the answering jack and the associated multiples and thereby apprising the toll operators that Portland has the line in service via the *B* board. Relay No. 2 also operates relay No. 4 which cuts in on the *B* operator's head telephone circuit. When the *B* operator inserts the trunk plug associated with the toll line into the called subscriber's line, or into a trunk jack to a sub-office, relay No. 5 operates cutting off the *B* operator and lighting the subscriber's supervisory lamp on the *B* board. Relay No. 6 operates when the subscriber answers, extinguishing the *B* supervisory lamp, and locking relay No. 7 in an operated position until the call is released by the Portland operator withdrawing her switching slug.

Another action of relay No. 5 is to cut the 2,000-ohm resistance in series with the line relays, causing relay *D* at Portland to fall back, lighting the guard lamp No. 2 and thus giving Portland notice that the *B* plug has been inserted in the called line. When the subscriber answers and relay No. 6 is operated, this 2,000-ohm resistance is short circuited, causing relay *D* at Portland to pick up again, extinguishing the second guard lamp and apprising the Portland operator that the subscriber has answered. When the Seattle subscriber hangs up, relay No. 6 falls back, removing the short circuit from the 2,000-ohm resistance, and causing relay *D* to again light its associated lamp.

The clearing signal is not given at Seattle until the Portland operator removes her plug, whereupon relays No. 3, 2, 1, and 7 fall back, and relay No. 5 being operated, causes

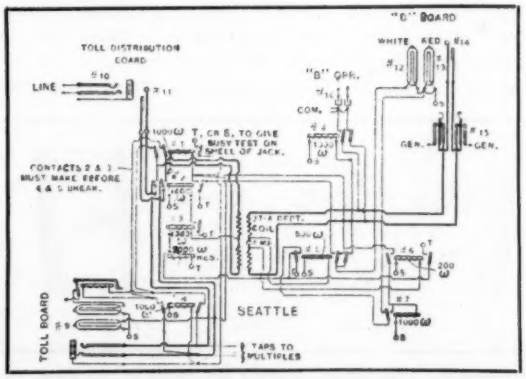


Fig. 5. Direct Trunking from Toll Line to "B" Position.

both supervisory lamps to glow until the *B* operator removes the plug, when all parts of the apparatus return to the normal positions. In this condition the line can be used for normal toll purposes, ringing on the line operating the regular line signals only, the Seattle operator answering the signal by plug-

ging into the line jack and cutting off the trunking apparatus by means of relay No. 8. This cut off feature gives the Seattle operator an equal chance of securing the line for outgoing business and renders it impossible for the operator at Portland to monopolize the line.

Except that the Seattle *B* operator is instructed to give the direct toll line trunks special attention, there is nothing to distinguish them in supervision from any of the local trunks, but a sounding relay associated with the lamps of the direct toll line trunks which is mounted beneath the keyshelf of the *B* board to aid in attracting the operator's attention to insure the most prompt disconnections.

Similar circuits were used between Tacoma and Seattle, provision being made also for Seattle to call Tacoma subscribers in the automatic exchange by means of an automatic calling device, which is described later in this paper. Calling with an automatic calling device as above has been tested successfully from Seattle to Portland, and there was no electrical reason for not employing it.

If, in calling Seattle numbers directly via the *B* board, the desired party was found to be out, the Portland operator would say, "have him call long distance 16." Upon the called party requesting this number of the long distance recording operator at Seattle, she understood that the call had originated at Portland, and after so informing him, obtaining his number, etc., would notify the operator on the Portland line who in turn notified Portland, who would complete the call via the *B* board.

Since the Northwestern Long Distance Telephone Co. connected with the local automatic exchange of the Home Telephone & Telegraph Co., of Portland, and local automatic exchange of the Puget Sound Home Telephone Co. at Tacoma, before the latter was absorbed by the Pacific Telephone & Telegraph Co., the opportunity offered to improve the service to those cities by permitting distant connecting exchanges on the system of the long distance company to call subscribers at Portland and Tacoma by automatic means. It was decided at the outset that to insure satisfactory operating and traffic results, the normal uses of the lines so equipped must not be restricted in any way—that is, it must be possible to signal the toll operator at the city having the automatic local exchange in the usual way from offices on the toll line, and vice versa. Also that means be provided on the toll board for checking, supervising, and listening in on all switches called directly from the distant office to insure proper timing of service and handling of lines, and proper discipline; the latter being important for the reason that called local subscribers assume that the operator is also local, and would censure the toll company for any breach on the operator's part, it being remembered that the distant operators are not in the employ of the toll company. Further, that no call into the automatic exchange should be possible without the toll operator of that city being immediately apprised, by means of lamp signals above the line jack, of the attempt, and of the response of the called local subscriber.

At the distant office two spring jacks, Fig. 6, are provided; one for normal switching, having a signal associated therewith; the other an auxiliary jack, being used for automatic calling only. The operator first ascertains by listening in on the regular or normal jack if the line is idle (if a way line), and then withdraws the plug and inserts it into the auxiliary jack and proceeds to "dial" the number without further preliminaries. On the completion of the dialing, two impulses are made by calling the digit "one" twice in quick succession which rings two short bells at the called subscriber's telephone in the automatic exchange. It has been found that this method of ringing is more convenient than to ring with the regular cord ringing key. However, by the introduction of an additional relay, as *E* Fig. 1, in the apparatus set at the calling office, such cord key ringing may be effected. In such case the distant office would ring the local subscriber in the automatic exchange in the same manner as in ringing on a direct line.

The automatic exchanges referred to are what is known as the three-wire Strowger system, thus necessitating the use of a ground in connection with the two line wires to affect

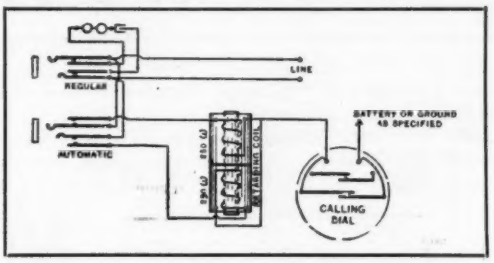


Fig. 6. Calling Office Circuit, Automatic.

a call. In the first experiments looking toward the use of the automatic feature on the toll lines, the three-wire principle was adhered to, and gave satisfaction on those lines serving the two terminal stations only as trunk lines, but where three or more stations were served, it was seen that to keep the two wires from any loop connections would involve too many complications in station equipment. Another thing that rendered the three-wire circuit on the toll end practically out of the question was that any kind of ringing current used for signaling between stations would vibrate the relays of the apparatus set and cause a great deal of trouble in the automatic exchange. Due to the operating conditions of the three-wire automatic system, this would be certain to cause a great many cut-offs and extraneous noises on other lines in the local automatic exchange.

The so-called "two-wire" system of calling was, therefore adopted, with the necessary modifications to translate from the two-wire system on the toll line to the three-wire system on the local automatic exchange. The only difficulty met was due to the fact that in this system the connector or last switch of the series involved in making a call in the local automatic exchange drops back, if the line called happens to be busy. A "vertical" impulse following, which would ring on the called line if it had been selected, serves to step the connector "off normal" and automatically gives the busy tone to the calling party. If, however, the "vertical" impulse were followed by a "rotary" impulse, the connector would again step up and another vertical or series of vertical impulses followed by a rotary impulse would select one of the 100 lines served by this connector, and ring some subscriber—almost certainly the wrong one. To guard against this, two different types of repeaters or translators were developed; one depending upon a small step by step mechanism, Fig. 7, similar to that used by the automatic system in meter switches, and the other, Fig. 9, depending upon a polarized relay being actuated by the proper polarity from the calling station, to eliminate the rotary impulses after the subscriber's number has been selected.

The first method is one used in the circuit shown in Figs. 6 and 7. In Fig. 6, the two line wires are connected to a double wound retardation coil, from the center of which the circuit can be traced through the contacts of the calling device (normally closed), to grounded battery, or if desired, to ground direct. To trace a call on these circuits, take for instance a station having the calling device grounded and of course having battery current on the repeater, Fig. 7, normally none of the calling station apparatus is connected to the line, and it is only when the calling operator plugs into the automatic jack that it is so connected. If the toll line is free, the desired local number is obtained by rotating the calling device successively according to the digits, and letter prefix corresponding to a digit of the subscriber's number.

If the digit 5 is called, for instance, the ground will be interrupted five times in quick succession by the calling device, after which a comparatively long pause follows while the operator is preparing to "dial" the next digit. It is this prolonged pause which is utilized to give the rotary necessarily following each digit in the three wire system.

After the number has been selected, ringing, as before

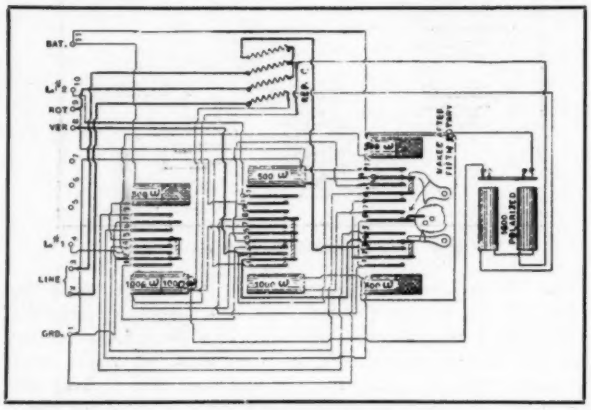


Fig. 7. Toll Line Automatic Apparatus Set.

stated, is accomplished by calling two digits 1 on the calling device, giving a distinctive double ring peculiar to "Long Distance," the toll operators at the cities mentioned using a similar code in ringing subscribers. If the subscriber's line is busy, the busy tone apprises the calling operator of the fact. If the called party answers, the call is handled in the usual way, and upon completion the apparatus is released by the calling operator merely withdrawing the plug for a second, after which the line and equipment is ready for another call. Fig. 7 is a set similar to that in Fig. 1, previously described, having point No. 1 grounded, Nos. 2 and 3 connected to the line wires, No. 4 to a lamp associated with the answering jack of this line, Nos. 8 and 9 to the vertical and rotary wires respectively of a trunk terminating in a "first selector" in the automatic exchange. No. 10 is wired to a second lamp associated with the answering jack, while No. 11 is main battery as before.

The ground which was traced to the line wires in Fig. 6 may be followed through the two windings of the repeating coil, through the double wound relay *A*, through the contacts of relay *G* to battery. Relay *A* lights lamp No. 1, which apprises the operator that a call is about to be made. It also operates relay *F*, which cuts in the trunk to the automatic exchange and throws a ground on the fourth spring of relay *A*. When the calling operator manipulates her calling device, the line circuit is broken a number of times corresponding to the digit or letter called. Relay *A* falls back with each impulse and "repeats" each impulse to the vertical wire of the trunk, and also causes relay *B* to pick up, which in its turn operates relay *E*. Both *B* and *E* are sluggish relays, having a short circuited winding or a heavy copper cylinder on one end of the core, and therefore do not fall back in the short interval between impulses. They do fall back in the longer intervals between the various series of impulses corresponding to the several digits, first *B* falling back, after a short interval, *E*. Tracing the circuit, with *E* picked up and *B* in the normal position, there is a ground on the rotary side of the trunk, which serves to give the necessary rotary impulse at the end of each series of vertical impulses corresponding to the digits called.

Each time relay *E* picks up, it steps up the small ratchet wheel shown in Fig. 7, the steps being held by a pawl controlled by relay *F*. Each number of the automatic exchange is composed of five digits, as *A*1,000, *B*1,900, *C*3,200, etc., and this wheel is adjusted to complete the contact of the spring actuated by it at the completion of the fifth rotary impulse. This operates relay *C* which reverses the automatic trunk, and disconnects the vertical impulses coming from relay *A*. When the calling device is again operated, this time to ring the subscriber, the same sequence of relay actions takes place as before, but as the vertical impulses are disconnected, the automatic trunk is not affected until the rotary impulse. The trunk being reversed, this is thrown on the vertical side of the trunk, ringing the subscriber, or if the line is busy, stepping up the connector switch to "off normal," and giving the characteristic busy tone.

Upon the subscriber removing the receiver, battery and ground are thrown back on the trunk from the connector switch, operating relay *D*, which lights lamp No. 2, and apprising the checking operator on the toll board that the conversation is about to begin. When the call is completed and the calling operator removes her plug, relay *A* falls back, *B* and *E* picking up as before. After about one-half second, relay *F* falls back and disconnects the ground which operates *B*, consequently *B* falls back followed by *E*, giving a rotary impulse as before. With *F* in a normal position, however, the automatic trunk is short circuited, and this causes the rotary impulse to give the "short and ground" necessary to release a call in the three-wire Strowger system.

The reason the trunk is reversed instead of the rotary being merely disconnected after the fifth rotary is that a false ring would be given on release before relay *F* fell back and released the call, thus calling the subscriber back to the telephone on a false call. Also, in case the calling operator discovered that a wrong number had been called, it would be impossible to release without giving a like false ring, all of which would not add to the prestige of the automatic system.

As stated before, grounded ringing power or ringing power subject to grounds must be guarded against when the switch is not in use, and this is accomplished by means of relay *G*, a polarized relay bridged across the line. When ringing impulses come in over the line, this relay vibrates, and keeps relay *A* from securing enough current to operate.

It will be noticed that lamp No. 1 flickers with each impulse from relay *A*, and these interruptions could be utilized to operate an indicator over the answering jack, or tape register if it was considered advisable for the sake of convenience in checking calls.

In automatic apparatus set previously described, Figs. 6 and

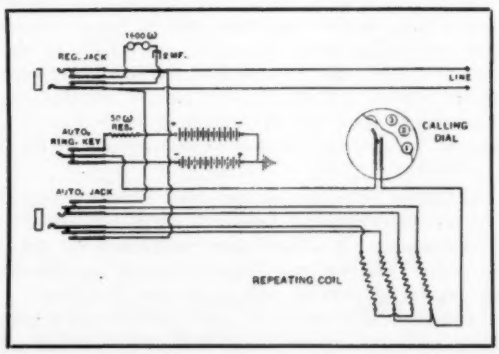


Fig. 8. Calling Station Apparatus for Polarized Ringing.

7, the step by step mechanism is utilized to eliminate the rotary impulse after the fifth digit is called, but in the repeater set about to be described, Figs. 8 and 9, a reversal of the polarity or direction of the current is depended upon to accomplish the same result. The latter method has the advantage of a more positive ringing control, but has the disadvantage of requiring

battery current at the calling station: minus polarity for call ing, and plus polarity for ringing the subscriber. While the first set described required a step by step mechanism, the latter requires additional relays, which although not complicating the action of the set, still take up considerable extra space.

Where the calling station has no battery supply, the former is the only choice. Where battery is available, the choice is about even between the two systems with a slight preference for the second type on account of its more positive action. The operations of calling are identical and will not be gone into in detail. To ring the subscriber, the calling operator, using the latter circuit, depresses a self restoring key associated with the calling device which reverses the polarity of the battery as can be seen by tracing Fig. 8. This ringing of the called party in the distant automatic exchange could be accomplished by introducing a relay similar to relay *E*, Fig. 1, at the calling office. and using the usual cord ringing key.

The functions of relays *A, B, C, D, E,* and *F*, Fig. 9, in calling are practically identical with the functions of the similar relays in Fig. 7, and can be followed by reference to the preceding explanation of that circuit. The only difference is that the controlling relay *F* is operated by the polarized relay *G*, Fig. 9, which operates in the minus direction when actuated by the calling current.

When the current is reversed by the ringing key at the calling station, relay *G* operates in the plus direction, operating relays *E* and *C*, the latter locking itself during the remainder of the call. Relay *A* not being sensitive to directional currents remains actuated and consequently relay *B* does not pick up. In this position, with relay *E* actuated and relay *B* normal, the rotary side of the trunk would be grounded but for the fact that relay *C* has reversed the trunk, throwing this ground on the vertical wire instead, ringing the subscriber. The impulse wire from relay *A* is disconnected for the prevention of false rings. Local supervision by means of relay *D* and lamp No. 2 and the release at the termination of the call, are all accomplished in the same manner as shown in Fig. 7, and need not be detailed again.

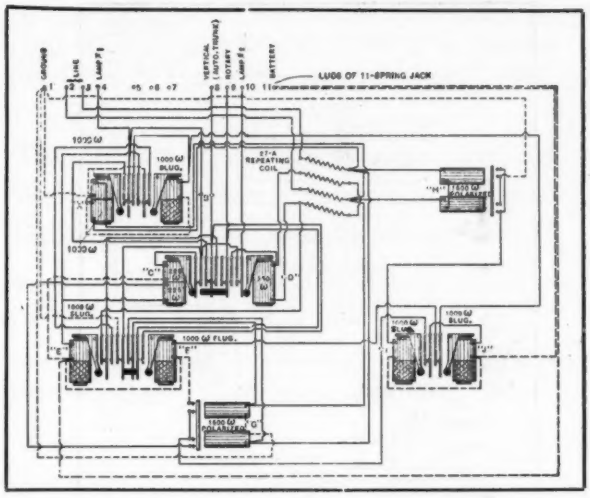
In guarding against grounded ringing, it was found that on account of the extreme sensitiveness of relay *G*, Fig. 9, to such disturbances it was necessary to bridge polarized relay *H* across the inner terminals of the repeating coil and wire it in such a manner that any ringing currents from the line would vibrate its armature, actuating relay *I* and disconnecting the set from ground, preventing the abnormal currents from causing any trouble. In Fig. 7, it will be observed, a single polarized relay was sufficient for this, and the additional relay *I*, Fig. 9, was only added after it was found advisable for the sake of additional positiveness of action.

It will be observed that any accidental ground on the line will not cause a permanent "off normal," as is the case of local lines in the "three-wire" system, since the automatic apparatus in the local exchange returns to normal upon the ground clearing, by means of a release action in the apparatus set. This is particularly fortunate, since long, exposed toll lines are always subject to accidental contacts of this nature.

One valuable feature in these repeaters is that any number of stations on the line may be equipped with automatic calling devices, or the more important ones may be thus equipped, and the rest allowed to operate on the line the normal way only. Thus the ordinary operation and efficiency of the line is not affected, the automatic feature being simply an added convenience and time saver to the stations employing it.

The toll operator endeavors to check closely and time all switches called directly by automatic means by the distant operator, but in the event of heavy traffic on other lines under her care, can ignore the automatic lines and still not lower the standard of service to patrons, as no calls are retarded and the distant operator at the calling office is lead to assume that her operating is being constantly supervised.

A vital condition manifesting itself in long distance automatic operation, which does not occur in local automatic operation, is that to insure quiet long distance lines it is necessary to introduce a repeating coil in the circuit between


GROUND
LINE
LAMP #1
VERTICAL (AUTO. TRUNK)
ROTARY
LAMP #2
BATTERY
LUGS OF 11-SPRING JACK
1000Ω
1000Ω BLDG.
1000Ω
1000Ω BLDG.
1000Ω BLDG.
1000Ω BLDG.

ing keys thrown, and thus demand less attention and care on the part of operators.

At the right of the cord listening keys is the supervisory key with a position call wire lamp associated therewith, the relay actuating the lamp being mounted on the under side

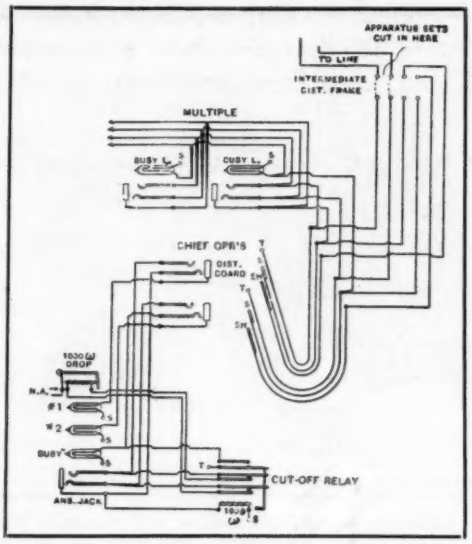


Fig. 10. Office Line Circuit at Portland and Tacoma.

of the keyshelf, so that the closing of it will make enough noise to quickly attract the attention of the operator to the signal. Should the called operator be listening to a conversation at the time, she throws the supervisory key cam to the front position, which places her in connection with her call wire, cutting off the cord listening keys, and when through she returns it to the center position, when she is again supervising the cord conversation—the cord listening keys not having been disturbed. The rear position of the supervisory key allows unobstructed listening and talking. The center or supervisory position of the key, short circuits the secondary of the operator's telephone induction coil and cuts in a 3,000-ohm non-inductive resistance.

Non-inductive resistance is used in lieu of inductive resistance, since the speech may be further attenuated without rendering it unintelligible. It is not necessary to restore a listening key on a conversation should an operator desire to converse with another local toll operator—she simply depresses the corresponding order button, the cord listening keys being cut off by a relay before she gets the order wire connection, this operation being effected regardless of the position of the supervisory key. All supervisory circuits are so designed that no noise is discernible to correspondents on whom an operator may be listening, by any manipulation of the supervisory key or order buttons. Operators can listen on front or rear cords independently, and that without first restoring the regular cord listening key of the set, that is, the cords can be cut in both directions with the normal listening key thrown to the listening position.

Reliability of action has been a first consideration in devising the equipment described. Although a circuit in which a number of functions are combined in one relay may look simpler in the circuit diagram, and may even have a lesser first cost, by providing several relays with simpler and more positive action, the reliability of the apparatus may often be increased and maintenance reduced.

In dealing with local exchange equipment the increased first cost due to elaborate equipment would be a fatal condition where the revenue per line is comparatively small. But where long and heavy copper circuits on expensive construction, and the time of operators is concerned, the revenue running to several dollars per hour, the first cost of an apparatus set constructed on apparently extravagant lines is a comparatively insignificant percentage of the total investment. To put it differently, if an expenditure of $10,000 on a toll line is justified by the traffic offered, each 1 per cent. of gain in efficiency should warrant an extra expenditure of 1 per cent. of $10,000, or $100, which exceeds the total cost of the most expensive of the line equipment described. Consequently, the use of automatic apparatus whereby any appreciable improvement in service is obtained is in every way consistent with attaining the highest commercial efficiency of the plant. (*Conclusion.*)

The Telephone Inspector and the Troubleman

Conclusion of a Series of Articles Begun in the September 7 Issue of Telephony—They Deal in an Elementary and Explicit Manner With Many of the Problems Encountered by Telephone Men in the Operation of Small Exchanges

By A. E. Dobbs

When they arrived at the first exchange, at Andville, they found that there several wires had come down across trolley and electric light circuits, but had been taken off by the lighting company's men. They left these wires as they were as service could be given over them, and hastened to look over the exchange equipment. As there were some fuses but no lightning arresters to protect the board, a number of drops were open, and some fuses burned out, which probably saved many more drops. These were replaced, and leaving Will to look after some burned out coils in subscribers' sets and to fix up the lines upon which the electric light linemen had cleared the crosses with the power lines, George hurried on to the next town to see what could be done there.

At Bankton, the situation was not bad, because there were no trolley wires near any of the leads, but lightning had done some damage. As there was very little line trouble, for there were only about 90 subscribers and the lines short, he was able to clear the trouble during the following forenoon. Returning to Andville, he found that Will had likewise nearly finished his work. They were therefore able to get back to Independence that night, thoroughly tired out from the strenuous work which they had had.

"Well," said the manager the next morning, "what do you recommend that we should do over at those exchanges?"

"In Andville," replied George, "there are 115 subscribers on a 100-drop board. As some of them are on party lines, there are only about 85 lines coming into the exchange, but while we are about it we should put in a strip containing lightning arresters and fuses for 100 lines. Those fuses you have over there are nothing but common lead wire. They are supposed to give way at one ampere, but it is well known that lead wire changes its carrying capacity after

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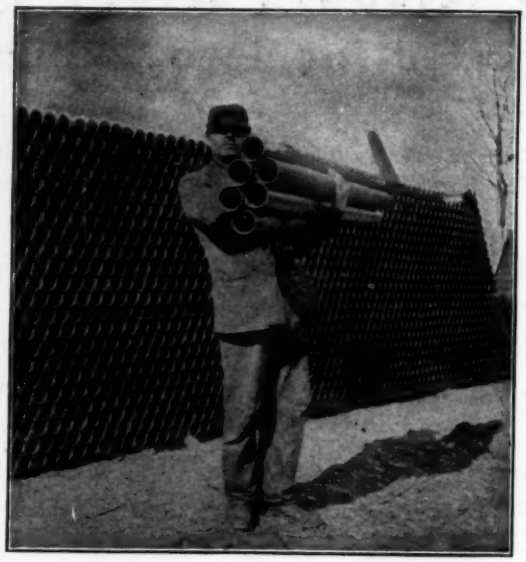

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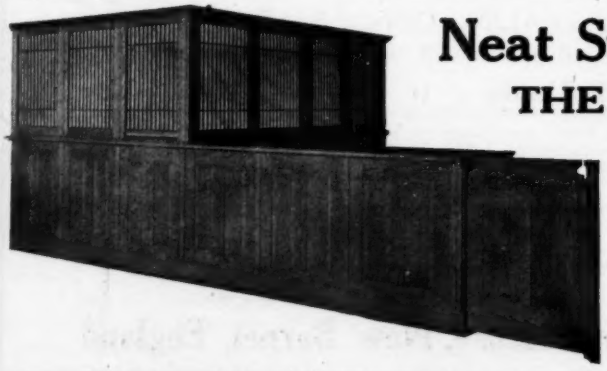

Neat Substantial Inexpensive

THE BROWNELL SYSTEM

of Interchangeable Unit Office Fixtures

Shipped knocked-down and assembled with a screwdriver.

All styles of telephone booths.

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C. H. BROWNELL
PERU INDIANA

being exposed to the air for several months, so that it will probably take double this amount of current to fuse them, and that would undoubtedly damage the coils.

"As to the instruments, there are about 50 whose lines cross over trolley and electric light circuits. These should, I think, be protected by five ampere fuses and arresters at the subscribers' instruments. Five ampere fuses are light enough for this, as we don't want those fuses to give way for every little current that comes along."

"At Bankton," George continued, "I think it would be well to simply put in fuses and carbon block arresters at the board, and let it go at that, as we have no trolley troubles there. In both places the cross-connecting is done by placing the two ends of the connecting wires under washers, held down by screws in wooden strips. This should be done away with, and the wires either fastened to brass strips by machine screws or else brought to brass clips and soldered."

"Then," summed up Mr. Risk, "we need for Andville, carbon block and fuse arresters for 100 lines and a cross-connecting board large enough for 200 lines. We will make that large enough while we are about it. For Bankton, we need a cross-connecting board of 100-line capacity and arresters with fuses. What kind of a cross-connecting board is best?"

"I prefer the binding screw method of connecting the ends," answered George.

"How about the brass or German silver clips and soldered connections?" asked Will.

"Which is the cheaper?" questioned the manager.

"The brass clip," replied George, "is cheaper in the first place, but you have to consider the time lost in making connections. You have to heat your irons to solder with and that takes lots of time when you are in a hurry."

"The troubleman at the Bell exchange," broke in Will, "tells me he can solder a row of strips quicker than he can put the wires under binding screws."

"So you can," George agreed, "if you have an electric soldering iron, and after you have your iron heated for a whole row. But suppose you only have two or three to change, then you lose time."

The Manager Decides a Question.

"Now, look here," interrupted the manager, "you two fellows both agree that a soldered clip makes a good connection. We can use some of those hardwood strips we took out of this exchange and make our own cross-connecting board. By taking some sheet brass, we can get the clips made down at the machine shop. Then we can buy porcelain fuse blocks with the carbon blocks attached, and install that at Bankton. As that is a rather slow town, there will not be many changes to make there after it is once installed. As to Andville, suppose we order the screw connections for that place, as there will be a good many changes there next season. How does that plan strike you? Remember, they are both small exchanges, and we don't want to spend any more money on them than we have to."

"That program is all right," endorsed George. "But at the place where the wires cross the trolley and electric light lines, we should use insulated wire or else run guard wires above them, the more so from the fact that some of those wires are getting rusty."

"Why," argued Mr. Risk, "those wires have only been up about three years."

"True enough," responded George, "but a poor grade of wire was used and it will not hold up longer than a year more."

"That is what comes from contract work," grumbled the manager. "Well, we will let that go until next season, anyhow. When you go over there, you can take some No. 9 wire and put a guard over the trolley. We will take chances with the electric light lines as that system is not grounded anyhow. This plant seems to be one continual expense.

"Well, we must live and learn, but when we get it fixed up this time, the expense account will be much smaller. I hope so at least. If I ever build another exchange I will use either copper or copper-steel wire. As fast as these wires wear out, I am going to replace them in that way."

"I would not do that in a small exchange," advised George, "because you can get iron wire that will last a great deal longer than the kind of wire you have in use. It is merely a question of galvanizing. I know of galvanized wire that has been in use on short toll lines for 15 years. When the lines were rebuilt last season, it was still in such good condition that it was transferred to the new lines, and appears to be good for another ten years at least. In the larger towns, however, there is so much smoke and gas, that the case is different, and in many places iron wire does well to last four years."

Just then the operators reported that some of the lines were very noisy. After listening a while on different lines, George located it on a certain lead. As it sounded like an electric light escape, he and Will both started after it.

About a half a mile from the office they found that the electric light men had been repairing the lines and had pulled their wire up against the lower wires of the telephone lead.

Will climbed the pole and lowered the electric light wire off its insulator and let it sag down about three feet. George called up the superintendent of the electric light company, and told him what had been done. The superintendent promised that his men would be more careful in the future when working near telephone leads.

A New Exchange.

Mr. Risk had secured a franchise for an exchange in a neighboring town and being unable, as well as unwilling, to build the entire plant himself, he had interested a number of local men, some of whom were represented on the board of directors. It was expected that the new exchange would probably have 200 subscribers, and the directors of the company suggested that they get together and discuss details. Meanwhile, Mr. Wilson had been sent over to survey the town, and on his return had several long conferences with the manager, discussing plans for the new plant.

"Now, gentlemen," said Mr. Risk at the meeting of the directors, held shortly after. "I will unfold to you a plan of equipment that will give you a good plant at comparatively small cost for instruments and switchboard. In the first place, in Independence, we have nearly 500 instruments, 400 of which I want to get rid. I wish to replace them with instruments of special design, as we have 100 instruments of that type already, and I want to have them all alike.

"The switchboard is also outgrowing its original limits, and is slightly out of date, although admirably adapted to a plant of 300 subscribers. We have so much trouble with electric light and power induction that it is necessary to have a different type of coil, both in the switchboard and ringers. Most of the old type instruments in this plant have been rewired, so that for all practical purposes they are as good as new. In your town, where there is only one trolley road, and no day service by the electric light company, you will find those instruments as good as any, and I will make the prices right. Should you desire to test and examine them, I will go around town with you and let you try them. I can also sell you the switchboard as I intend to replace it with another more adapted to large exchanges."

Then the argument began, one of the directors taking the ground that if the switchboard and instruments were not good enough for Independence, they were not good

enough for his town. This was all well enough, but against it was offered a saving of something like $1,500. Finally a visit of inspection to see the instruments, and a guarantee from Mr. Risk that every instrument sent out should be as good as those they had seen, settled the matter.

Upon their arrival in Independence George took them into the operating room, accompanied by two agents who had heard of their plans for the new company and who had come down for the purpose of selling apparatus. It goes without saying that the strong and weak points of the switchboard were thoroughly discussed, by the agents and Mr. Wilson, with the directors asking many questions.

Upon the return trip from Independence the directors decided to accept Mr. Risk's proposition for supplying the board and instruments.

"Now, Mr. Wilson," said the manager the next morning after the meeting, "the new company will want the switchboard from here inside of four months. Get to work on specifications for a 1,500-line multiple, common battery board to be delivered in three months. That will give you time to investigate the boards of different manufacturers for I want you to get the best for our purpose, present and future." (*Conclusion.*)

From Factory and Salesroom

Conventions: Western Pennsylvania Independent Telephone Association, Erie, Pa., July 11 and 12; Eastern Pennsylvania Independent Telephone Association, York, Pa., July 15 and 16

Portsmouth, England, to Install Automatics.

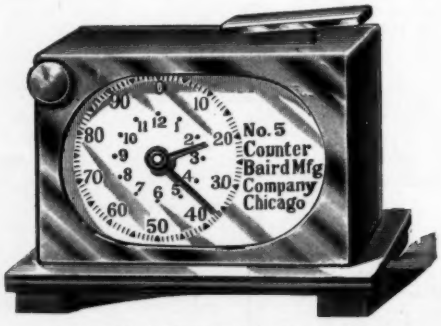
Recent cable advices from London announce the placing of an order for 5,000 lines of automatic apparatus for installation in the city of Portsmouth, with the Automatic Telephone Mfg. Co., Ltd., of Liverpool and London, a company organized by representatives of the British Insulated & Helsby Cables, Ltd., one of the largest manufacturers of cables and manual telephone apparatus in the world, together with representatives of Automatic Electric Co., of Chicago, for the purpose of manufacturing and selling automatic telephone apparatus in Great Britain, South America, and certain other foreign countries.

This installation is the fifth to be ordered by the British government, exchanges being already in operation in the general post office, London, and at Epsom, while a 6,800-line system for the city of Leeds, and a 2,000-line installation for Newport, are now being manufactured.

When the British post office department decided to take over the telephone system of the country, telephone experts were sent to Europe and America and the government began a series of tests of automatic switching apparatus. As a result of the thorough investigation, a 500-line exchange was installed in the general post office, London. The other four orders have followed as a consequence of the entirely satisfactory service rendered by the first installation.

The Baird Reversible Peg Counter.

The little instrument shown in the accompanying illustration has made a place for itself in the telephone field.



The Baird Reversible Peg Counter.

Each time the lever is touched by an operator the long hand counts one. As frequently as desired the supervising operator can note down the record of the counter and then, in a moment, set it back to zero, thus avoiding figuring the result.

Formerly, in Chicago, a special operator was employed behind each "B" operator on "peg count" days to take the count, but now because of the ease of operating the Baird No. 5 reversible counter, each "B" operator makes her own record. At these positions, therefore, the counters earn about their total cost each "peg count" day.

The rubber feet beneath the counter prevent slipping, noise and marring the switchboard. It is said that hard usage has little effect on the instrument, as it is very strong and durable.

The Baird Equipment Co., 3233 North Clark street, Chicago, Ill., which manufactures the extensively used Baird pay station and Baird time stamps, is the manufacturer of the No. 5 Reversible "Peg" Counter.

A New Glass Cutter.

The accompanying illustration shows a new, improved self-oiling glass cutter with turret head which is made by

An Improved Glass Cutter.

the company which manufactures the well known "Red Devil" tools and sold by Smith & Hemenway Co., 150-152 Chambers street, New York City. The oiling device in this tool is located behind the six wheels. This cutter has a very hard tempered pinion so that the wheels run uniform and true, and the cutter can be adjusted to use any wheel, thereby getting the benefit of the full service of all. The best hand-honed wheels produced by the company are used for this cutter and one of the principal claims of the company is that "It's all in the wheel." The frame is so designed that it protects the wheels and prevents them from coming in contact with moisture.

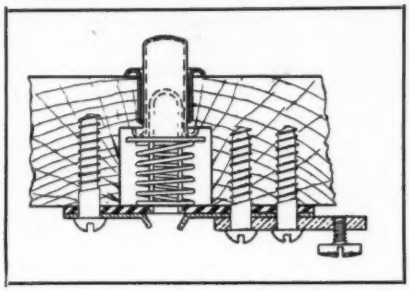
The manufacturers have adopted for this tool the "scientific" handle used for all of their cutters. The tool is beautifully finished, having a solid steel instead of cast iron head, the latter being coppered and nickeled. It is stated that upwards of 2,500,000 "Red Devil" glazier tools are sold annually, and these are shipped to every country on the globe. They are packed in especially prepared paraffine paper, a dozen in a box.

New Intercommunicating Telephones.

The accompanying illustrations show types of common talking, selective ringing instruments for the intercommunicating telephone system designed by the Stromberg-

Carlson Co. These are intended for use on small systems in which the volume of traffic does not require co-existing conversations. Two standard sizes of this equipment are furnished, namely, the five and ten button types, for six and eleven station systems respectively.

This system operates from one set of six dry cells lo-



Sectional View of Key.

cated at some convenient point and can be installed with or without trunk line connections to a common battery main exchange. An ingenious relay trunk switching device has been developed permitting calls for the main exchange to be originated or answered at any local station. This feature is of exceptional value in systems where no station is regularly used in answering incoming calls.

The equipment of all telephones is of the same standard grade as that used in apparatus for use in connection with large city exchanges. The transmitter is of the No. 7-B type which gives distinct transmission both locally and for toll service. The receiver employed is of the electromagnetic type which is rapidly coming into general use. This receiver does not require an associated induction coil and thereby greatly simplifies the wiring of the instruments. Attention is drawn particularly to the sectional view shown above of the non-locking push button key employed in these instruments. It will be noted that the contact between the common return plate and the line terminals is made by means of inverted U-shaped spring which when depressed exerts a lateral pressure against both contact surfaces. This method of construction together with the downward wiping action is said to insure a perfect contact under the most adverse service conditions.

The Stromberg-Carlson Co. has prepared some co-operative advertising literature in the form of attractively col-

Wall and Desk Sets of "Inter-Comm" Telephone System.

ored return post cards for the use of telephone companies desiring to increase their "Inter-Comm-Phone" business. This advertisng matter bearing the telephone company's name will be furnished upon application to the main office at Rochester, N. Y.

The "Automatic Telephone" for July.

The July issue of the Automatic Telephone, the paper published monthly by the Automatic Electric Co., has just been issued. The high standard set by the first issue, last month, is maintained. In addition to numerous short, newsy items, there are other features certain to interest those fortunate enough to be on the mailing list.

An article on the "Development of the Automatic Telephone" briefly sketches, in an interesting manner, the origin of the automatic telephone and traces the development of the Automatic Electric Co.

The two articles in serial form, which were started in the first issue, by B. C. Groh on "Development Studies and the Fundamental Plan" and Roy Owens on "Scientific Management of Telephone Exchanges" are continued. A new series of articles is begun in this issue by Arthur Bessey Smith. It is entitled "The Fundamentals of Automatic Telephony." It is the object of this series to deal with the simple principles of automatic switching. They will include the conception of the system, the arrangement and relation of its parts, the mechanism of the switches, and their electric circuits.

Other articles by W. F. Benoist on "Economy of Automatic in a 1,500-Line Plant"; by Harold D. Stroud on "How Modern Business Uses the Automatic Telephone"; and by C. Bertrand Thompson on "Right Filing and Easy Finding for Telephone Company Papers" all combine to make a most readable and interesting issue.

Ericsson Right at Home.

On the western shore of Lake Erie—that historic sheet of water, made famous by the memorable message of Perry's, after his victory over the British fleet, "We have met the enemy and they are ours"—is the city of Buffalo.

Buffalo is a lively little town and is getting a lot of free advertising just now, because Uncle Sam has kindly put out a new style of nickel on which a buffalo appears. People of Buffalo believe in advertising, and if they can get it free, so much the better; but they are bound to get it anyway.

Sometimes other cities that are jealous of Buffalo refer to it as "the town that is near Niagara Falls," and Buffalo does derive its electrical current from the tremendous electrical energy that is developed there. It is therefore to be expected that Buffalo would be prominent in the electrical trade, and it fully comes up to expectations in that respect.

There are a lot of live, hustling electrical dealers in Buffalo, one of the largest of which is the Robertson-Cataract Electric Co. This company has a beautiful store on Court street, and its show-room would do credit to a much larger city.

Besides the Robertson-Cataract Electric Co., Buffalo is also the home of Ericsson telephones. The old saying, "A prophet is without honor in his own country," does not seem to apply to Ericsson telephones, for their sale in New York is in the hands of the Robertson-Cataract Electric Co., which reports a brisk demand for Ericsson apparatus.

Everybody in the electrical trade in the Empire state knows "Billy" Robertson, the head of the Robertson-Cataract Electric Co. "Billy" is a big, genial fellow, a good "mixer," and one who always "puts it over." When he isn't selling Ericsson telephones and electrical supplies, there is nothing "Billy" likes to do better than to sing. Most people who want to sing shouldn't be allowed to do so, but "Billy" is an exception; he wants to, and everybody wants him to, because he is a mighty good singer, and always makes things lively when the electrical bunch gets together.

"Billy" sings the praises of Ericsson telephones as well as he sings some of the songs for which he is noted, and if he keeps on his business in Ericsson apparatus will soon necessitate his taking larger quarters. Ericsson is fortunate in having "Billy" to sing the praises of its telephone, for "Billy" is sure some seductive singer, and always comes home with the bacon.

Phoney Bill Favors a Sane Fourth.

That the idea of a sane Fourth is uppermost in the mind of our distinguished fellow citizen, Phoney Bill, on our great national holiday, will be instantly appreciated by even

Phoney Bill's Idea of a Sane Fourth.

a casual glance at the accompanying reproduction of the pictorial part of the July blotter calendar of the Stromberg-Carlson Telephone Mfg. Co. Phoney Bill is willing to let others celebrate the glorious anniversary of our independence in whatever way seems best to them but this sketch he says is his idea of "a sane way to celebrate a great holiday."

Automatic Time Stamp Co. Opens Chicago Office.

The Automatic Time Stamp Co., 160 Congress street, Boston, Mass., has opened a Chicago office in room 860 Monadnock Block, for the sale of its machines and as a complete service station to care for an already large number of customers through the west.

One of the devices of this company is the "Timeometer," which is said to be the only machine that prints seconds and computes elapsed time down to seconds, making it possible to keep a reliable check of long distance charges. This company is the manufacturer of the well known "Automatic Time Stamp" that has been on the market for a number of years and has sold all over the world.

Among the other machines manufactured by this company is the "Automatic Time Register," a combination machine for the timing, in and out, of employes. With this machine, starting and finishing time, on job or work tickets, can be printed.

The company also makes the "Durograph Elapsed Time Recorder," a machine which automatically records the starting and stopping time and gives the elapsed time. The company has several different styles of this machine, and has just brought out its "Wilson Electric Self-Winding and Secondary Clock" system which is said to be a great advance in this art. Time stamps can also be electrically operated in connection with this system.

The Automatic Time Stamp Co. was established in 1880 and states that it was the originator of printing time automatically. We are glad to welcome its new office in the western territory and wish the company the best of success.

More Automatic Telephones for New Zealand.

Two more orders for automatic telephone equipment have just been placed with Automatic Telephones, Australasia, Ltd., exclusive sales agents for Automatic Electric Co., of Chicago, in Australasia, by the New Zealand government, which administers the telephone system of the dominion.

After a thorough investigation of telephone progress in Europe and America, T. Buckley, chief electrician of the Department of Post and Telegraph of New Zealand, recommended to his government the adoption of automatic equipment. Preliminary installation of 500 lines in the cities of Wellington and Aukland were ordered. The Aukland plant is approaching completion, while the exchange in Wellington has been in operation since the early part of May. It has been very closely observed by the government officials and they consider that it has met every demand made upon it. The apparatus just ordered, including 800 lines to extend the automatic system in Aukland and 500 lines for additions in Wellington, will be placed in operation as soon as the apparatus can be shipped and installed.

Paragraphs.

Blake Signal & Mfg. Co. announces its removal from 246 Summer street to 251 Causeway street, Boston, Mass.

McRoy Clay Works, Chicago, on its July calendar blotter, cheers up the man who has not succeeded in accumulating a supply of this world's goods with these words: "It's easy to accumulate money in this country. After a feller gits his first million, there's nothin' to it."

Diamond Expansion Bolt Co., 90 West street, New York, N. Y., has issued catalogue No. 285, a 50-page publication, describing, illustrating and listing the Diamond and Keystone expansion bolts, "Rapid Fire" drills and Diamond specialties. Several interesting expansion bolt installations are shown in the catalogue, which is a very complete exposition of the company's product.

Severe Electrical Storm at Greensburg.

The latter part of last month Greensburg, Ind., was visited by one of the most severe electrical storms ever experienced by the oldest inhabitants. Several barns and houses were struck by lightning and thousands of dollars of property loss was sustained. The telephone plant of the Decatur County Independent Telephone Co. was put entirely out of business.

One 400-pair cable was melted into a solid mass in an underground lateral from a cable box to a manhole. Three 100-pair aerial cables were also burned in several places. Many telephones were destroyed and 1,375 subscribers were out of service. General Manager Wm. F. Qualls wrote, however, seven days later, that all damages had been repaired and service resumed.

Going Some!

Within 15 minutes after they had passed through Marysville, Ohio, at an estimated speed of 40 miles an hour, five Dayton motorcyclists had pleaded guilty by telephone to a Marysville magistrate, to the telephonically transmitted charge of violating the Marysville speed limit, paid their fines, assessed by telephone, and were again on their way to Dayton.

After they had passed through Marysville the police of that place telephoned to Milford Center, five miles away, for their arrest. They appeared in a few minutes and village officials acted as agents for the Marysville authorities.

In the Rural Line Districts

The Star Telephone Co. has a gang of men in Wood River repairing its telephone lines.—Wood River Item, Alton (Ill.) Telegraph.

The telephone line north and east of Primghar is being repaired, new and larger poles put in. The holes are being dug with dynamite.—Paullina (Ia.) Times.

Work has been begun on the erection of a telephone line on West Hill.—Stowe Item, Waterbury (Vt.) Record.

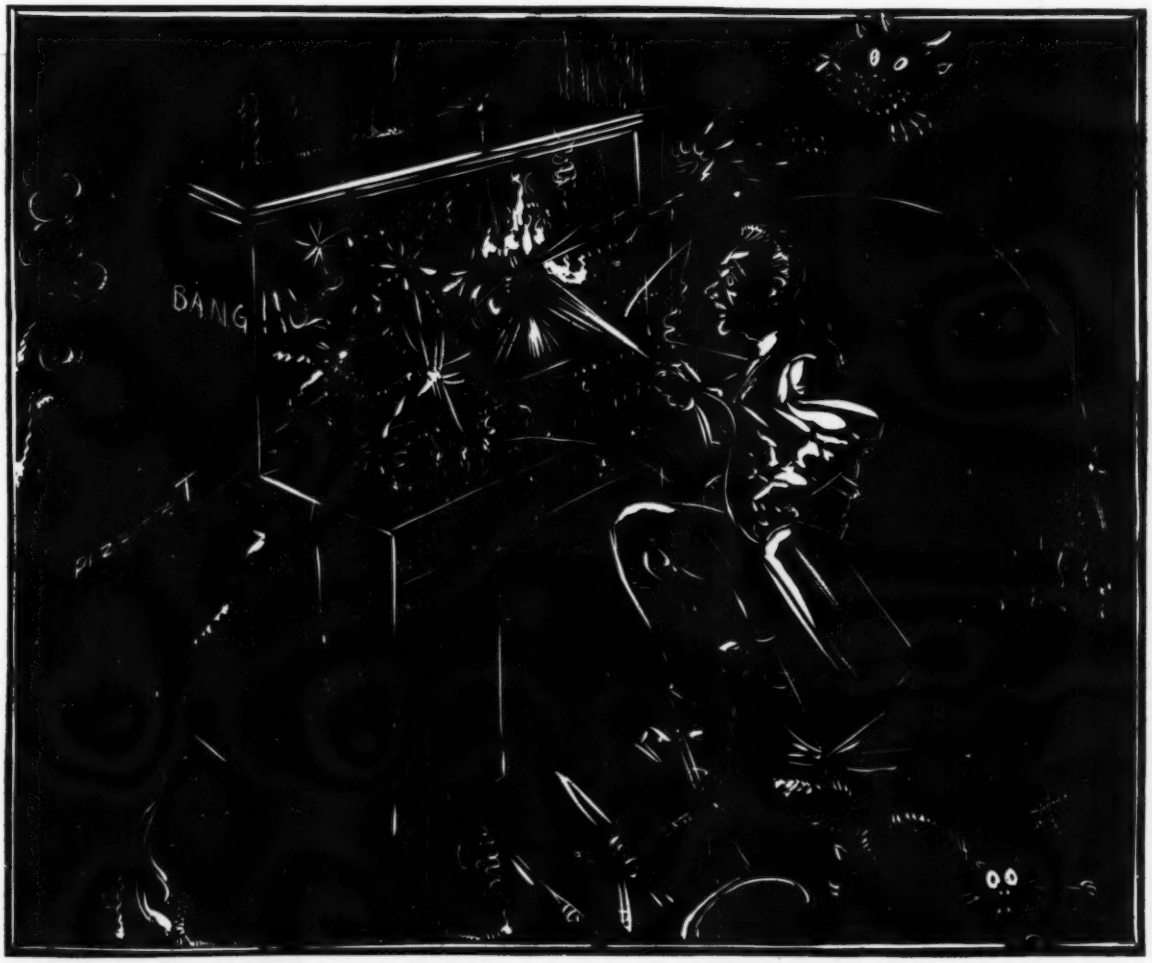
D. I. Van Olinda has nearly completed his telephone line along the county road.—Everett (Wash.) Herald.

The linemen of the Dakota Central Telephone Co. have recently been provided with large metal buttons on which is printed their number and the fact that they are in the employ of the telephone company. This action on the part of the Dakota Central has been taken solely for the purpose of protecting their patrons. Several times in the past few weeks cases have been reported where men claiming to be telephone men have gained access to all parts of the house for other purposes. Now telephone users may know that unless a man claiming to be a telephone man is provided with his credentials in the form of one of these metal buttons, he is an impostor.—Watertown (S. Dak.) Opinion.

The Nebraska Telephone Co. has a large force of men here replacing some of the farm lines. In all about three thousand dollars' worth of new wire will be hung.—Central City (Neb.) Nonpareil.

The second half of the new telephone switchboard is expected to arrive here this week. The board will then be installed.—Sidney Item, Champaign (Ill.) Gazette.

The front office room in the Jameson Telephone Co. building has been rearranged the past week, and a neat private office for Manager Peterson put in. The company now has one of the most conveniently arranged telephone buildings in this section of the state.—Dows (Ia.) Advocate.



There was a hot time in the local telephone exchange last Thursday night about ten o'clock, during the rain and hail storm, and for a while the key board had the appearance of a thing to be avoided. Walt Nyberg, the superintendent of the local lines was in charge and had he been an amateur in the business he would probably have hiked for safer quarters. Walt had seen some irregular occurrences on the lines before but he never witnessed a demonstration like this. Little blue flames shot out of the holes on the key board and there was a hissing noise as if it were in charge of a demon. Wires were quickly put out of commission and for a short time things looked serious. It was afterwards learned that the feed wire of the interurban had come down and crossed the farmers' line that runs to the northeast. Luckily nobody was injured, but many telephone instruments were damaged, being rendered unfit for service.—Galva (Ill.) Standard.

Legal Cases and Decisions

By A. H. McMillian

Crossing Railroad at Highway.

"In our state, by legislative enactment, telephone companies are given the right to construct lines for telephone service along the public highways. These highways, of course, cross the railroads. The question of our right to cross the railroads has been raised by the railroad companies by an attempt to force us to get a permit every time we string a wire across their right of way.

There does not seem to have been a decision in our state on this question, and I do not want to go into a law suit in order to establish our rights in the matter. Would be pleased to have your opinion in regard to it.

They not only want us to sign a contract in regard to taking down and removing our wires on their demand, but on the streets of incorporated towns, they want to require us to give them a contract in which we agree to remove our conduits and cables under their track on their demand. We believe we are thoroughly in our rights in refusing to acquiesce in their demands."

We think you are right in your position. Having received permission to construct lines for telephone service along the highways, you have the right to cross the tracks where the highways cross them. The principle involved is that the use of a highway for telephone poles and wires is not a new use of it, but is just another form of the old use. As said by one court, "when these lands were taken or granted for public highways, they were not taken or granted for such use only as might then be expected to be made of them, by the common method of travel then known, or for the transmission of intelligence by the only method then in use, but by such methods as improvements of the country, or the discovery of future times might demand." People vs. Eaton, 100 Mich., 208; 24 L. R. A., 721; 59 Northwestern, 145.

Since the use of highways for telephone purposes is one for which it was intended, it follows that the railroad company in crossing the highway must submit its track to all the uses for which the highway was intended, including that of telephone purposes.

A Residence Telephone.

"Attached is a copy of letter received from the Oregon Railroad Commission regarding the definition of a residence telephone. The Oregon commission, as you will notice, desires to make a new classification between business and residence telephones, i. e., to determine the rate upon the primary use of the telephone. Taking in question, the grocery store, the primary use of the telephone is not for social purposes but business. Therefore, it should be a business telephone, but it is located in the only residence the grocer has. We also have a large colony of Chinese, who sleep under their counters, and insist on the residence rate, as they say that under their counter is the only residence they have, yet the primary use of the telephone is for business purposes.

I would like to know as to how the majority of telephone companies classify their telephones where there is a doubt as to their being business or residence telephones."

The letter referred to is as follows:

"Reporting on the complaint of the Oregon Camera Club that they have had their rate raised from 2.25 to $6.25 per month:

I have investigated and found the facts as related in letter to be correct. That the building is a residence remodeled and equipped for the purposes and convenience of amateur photographers; that, for a time, a Japanese janitor slept in these quarters; and that they now employ him for only part of his time and therefore the residence is not occupied by him at night.

In looking over the tariff as published by the telephone company, I find the rating of residence telephones and business telephones, and should this be decided as a business telephone, the rate of $6.25 is correct. Should it be decided as a residence telephone, the rate must be $2.25.

I communicated by telephone with the company, asking how they distinguished between a residence and business telephone, and I herewith attach letter from the manager, in which he says it is his opinion that a man's residence is where he sleeps.

I do not think this is a good rule to apply, as there would be nothing to hinder the writer from having a couch in our court house quarters and sleeping there, thus getting a residence rate on our telephones, which, in the case of both telephones, would effect a saving of about $9.75 per month.

A better rule seems to me to be that a telephone should be classified according to its *primary purpose*, as it is the *use and extent of its use* to which the telephone is put that is the vital thing for classification, especially so as regarding clubs or lodges, schools, libraries, etc. It would not be a difficult thing to meter the outgoing calls for a period of time and establish a classification. Under the present classification and interpretation of "residence," should the president of the Oregon Camera Club be sleeping there when he made application for the telephone, a residence construction could be applied.

The justice of rates in a case like the present one could be accomplished by establishing another classification to institutions that are not business concerns and yet are clearly not residences.

To better inform the commission, would it not be a good plan to secure and tabulate a lot of rates of different companies in different states?

In the present case, I do not think the commission would be wrong in deciding that, as the Oregon Camera Club is not a business, its rates should be classified as residence until rates for such concerns are established, thus placing the burden of initiation on the telephone company. I so recommend.—Respectfully Examiner."

The proper rule to be followed in classifying telephones as residence or business telephones is that the classification is determined by the regular, habitual, and substantial use of the telephone as distinguished from the occasional and incidental use. In other words, the fact that the subscriber does or does not sleep in the building where the telephone is installed, does not determine the question. The use that is made of the telephone determines it. If the telephone is used regularly, habitually, and substantially for business purposes, it is a business telephone. The fact that it is occasionally and incidentally used for residence or social purposes does not make it a residence telephone. On the other hand, if a residence telephone is used occasionally and incidentally for business purposes, that does not make it a business telephone. Cumberland Telephone & Telegraph Co. vs. Hartley, 154 Southwestern, 531.

In the case thus cited, the court spoke as follows:

"While we are of the opinion that a classification of telephones into residence telephones and business telephones is correct and proper, and that a larger rental may be demanded for the latter than for the former, we do not think an occasional use of the residence telephone in the manner just described, would be a substantial breach of the classification, and justify the charging of the higher rate." (Page 535.)

The usual practice of telephone companies, so far as it has come to our attention, is in accordance with this rule.

Correcting Invalid Stock Issue.

Some shareholders in the Rockland Telephone Co. of Wisconsin began suit to enjoin the issue of increased stock by the company, on the ground that the attempted increase was not legally authorized. Evidence was offered tending to show considerable irregularity, and it also appeared that a month after the suit was begun at a special stockholders' meeting the articles of incorporation were amended, apparently in correction of the former irregular attempt, and the increased stock issued in a legal manner. The complaint was then dismissed, but the defendant company required to pay the costs.

The Supreme Court of Wisconsin declined to interfere, saying "We cannot under such circumstances undertake to decide upon the legal effect of the irregularities in the first proceeding to amend the articles. We are too busy with serious matters." Zahn vs. Rockland Telephone Co., 14 Northwestern, 285.

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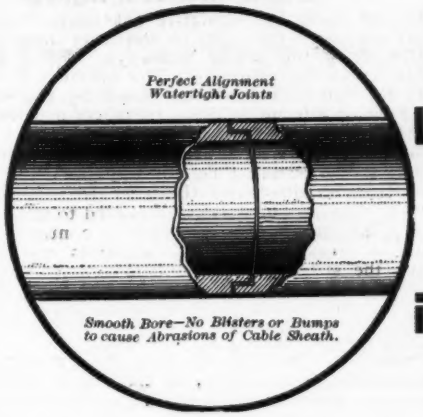

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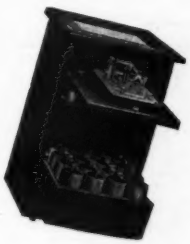

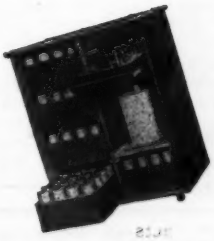

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Personal.

A. J. ADAMS, of Pattonsburg, Mo., has been appointed manager of the Farmers' Mutual Telephone Co., at Clarinda, Iowa.

F. L. BROWN has resigned his position as superintendent of the Long Beach, California, exchange of the Pacific Telephone & Telegraph Co.

W. R. COOK, formerly division plant superintendent for the Chesapeake & Potomac Telephone Co., at Lynchburg, Va., has been transferred to the Richmond office.

S. M. TUCKER, formerly manager for the Illinois Telephone Co., at Manchester, Ill., has been appointed manager for the company at Roodhouse, to succeed E. O. Turner, resigned.

E. L. MOWER, formerly in charge of the Oregon, Ill., office, has been appointed general manager of the Rock River Telephone Co., with headquarters at Rochelle, Ill., succeeding Steve Kennedy, resigned.

PROFESSOR ALEXANDER GRAHAM BELL recently received the honorary degree of Doctor of Laws from Dartmouth College at its one hundred and forty-first commencement, in recognition of his invention of the telephone.

R. S. MCCANN has resigned his position as local manager for the Wisconsin Telephone Co., at Hartland, Wis. Mr. McCann intends to do electrical work in Waukesha. W. C. Peterson, of Lake Geneva, will succeed Mr. McCann.

RAY F. SCOFIELD has resigned his position as district manager for the Michigan State Telephone Co., at Cadillac, Mich., to become district manager for a New York life insurance company. He will be succeeded by E. G. Stacey, of Grand Rapids.

G. C. ASHMORE, formerly in the collection department of the Bell company at Greenville, N. C., has been promoted to the position of district commercial manager of the Southern Bell Telephone & Telegraph Co. with headquarters at Greensboro, N. C.

FOSTER HUME, division commercial superintendent of the Cumberland Telephone & Telegraph Co., at Memphis, Tenn., has been promoted to the position of special agent to the general commercial superintendent of the company, with headquarters at Atlanta, Ga. F. L. Woodruff will succeed him.

EDWARD M. COOKE, of Denver, Colo., was recently elected business manager of the Keystone Telephone Co., of Philadelphia, Pa., a new position created since the death of C. E. Wilson, general manager. He will assume most of the duties formerly borne by Mr. Wilson except those relating exclusively to operation. Operating Manager J. F. Stockwell will have charge of the latter duties.

WARREN S. FUNK has resigned his position as district manager for the New State Telephone Co., at Sioux Falls, S. D., to take an executive position in the commercial department of the Tri-State Telephone & Telegraph Co., at St. Paul, Minn. Mr. Funk has been with the New State company for a period of seven years and has administered the affairs of the company with great credit to his own ability.

P. KERR HIGGINS, well known in telephone circles, has recently been made general manager of the Texas Independent Telephone System with headquarters at Waco, Texas. This system forms the back bone of Texas Independent companies, extending north and south with over 600 miles of long distance pole lines, 25,000 owned stations and over 30,000 connecting stations. It also owns 24 thriving exchanges, many of which have driven the Bell company from the field.

HARLAN E. BABCOCK, editor of TELEPHONY about eight years ago, has recently purchased a half interest in the Kalamazoo (Michigan) Advocate, on which paper he will act as managing editor. Mr. Babcock has been in the editorial business practically all of his life, having been associated with newspapers in the larger cities, among which may be mentioned the Philadelphia North American, the Chicago American and the Kalamazoo Gazette. His many friends will be glad to hear of his further promotion.

New Companies and New Incorporations.

SHELBYVILLE, ILL.—Articles of incorporation have been filed by the New Western Telephone Co. with $1,050 capital stock. The incorporators are: C. E. Robinson, B. F. Bowman and G. L. Forsyth.

BENHAM, KY.—The Benham-Looney Telephone Co. has been formed by K. S. Smith and others with a capital stock of $2,000. Mr. Smith will be manager of the company.
city.

LACKEY, KY.—The Lackey-Beaver Telephone Co. is being formed by Felix Asbury, George Gibbs and others. The capital stock will be $2,500.

SALYERSVILLE, KY.—The Licking River Telephone & Telegraph Co. is being organized here by J. B. Arnitt, G. F. Adams, H. H. Gullett and others, for the purpose of constructing telephone and telegraph lines in the Big Sandy Valley. The company will have a capital of $8,000.

NEWPORT, N. Y.—The Newport Telephone Co. has been incorporated by the following: Stephen C. Ormsbee, 1243 President St., Brooklyn, N. Y.; Leo C. Foss and Charles L. Fellows, both of Newport, N. Y. The capital stock is $9,500.

LUCAS, S. D.—The New Era Farmers Telephone Co. has been incorporated with $5,000 capital stock. The incorporators are: Olaf Lorenson, Michael Jones and Frank D. Faust.

CLINTWOOD, VA.—The Citizens Home Telephone Co. is being organized in this city by J. M. Remines, G. W. Beveraly and others. The company will have a capital stock of $3,000.

Construction.

LIBBY, MONT.—The Libby Telephone Co. proposes to run a line to Troy, Mont. a distance of 18 miles.

SPOKANE, WASH.—The Inland Telephone & Telegraph Co. will construct a new long distance line between Spokane and Lewiston, Idaho. Several important branch lines will be constructed from the main line and franchises have been secured in many towns, including Garfield, Oakesdale, Tekoa and Pullman, Washington and Moscow, Idaho.

Financial.

LEXINGTON, ILL.—The Lexington Home Telephone Co. has increased its capital stock from $20,000 to $50,000.

WINCHESTER, IND.—The Farmers Telephone Co. has recently issued $15,000 worth of preferred stock.

DAVISON, MICH.—The Davison Telephone Co. has amended its articles of incorporation by increasing its capital stock from $10,000 to $15,000.

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